AD-A191 419 TEST OF THE CONSTANCY - VELOCITY HYPOTHESIS: NAVY UNIT FUNCTIONING AND PERFORMANCE OVER 12 YEARS(U) RENSIS LIKERT ASSOCIATES INC ANN ARBOR MI* D G BOWERS ET AL. 1/2

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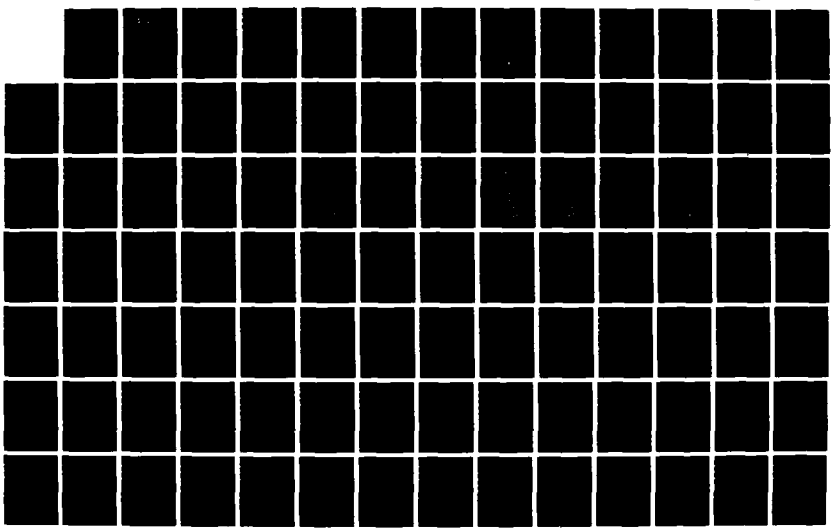

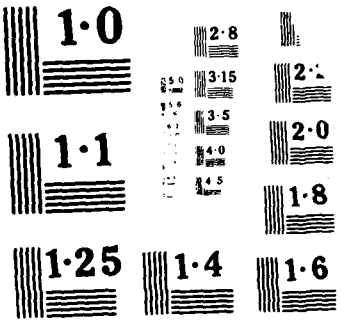
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"This study examines the effects of management and organizational practices and processes upon the performance of fleet units over a 12-year period. Velocity--the sheer number of persons pumped through a unit in two successive three-year periods is examined as a partial explanatory construct. The findings indicate that both unit practices and unit perfomance are remarkably constant, with the former in substantial measure causing the latter. "

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18. (continued) Peer Relations, Longetudinal Effects.

Table Of Contents

Chapter I
Overview of the Research

Beginning with Brayfield & Crockett (1955), and continuing over the next decade with Herzberg, Mausner, Peterson & Capwell (1957), and Miller & Form (1964), a series of reviews of studies of the relationship between attitudes of employees and their performance concluded that there was no dependable, predictable relationship between the two. This conclusion was quite at odds, however, with the accumulated findings of various researchers from the University of Michigan Institute for Social Research, which had been integrated into what was perhaps the first comprehensive metatheoretical statement of human organization management systems by Likert (1961). It was, perhaps, the first major theoretical statement to distinguish between causal variables, intervening variables, and end result variables in organizational functioning. Two years later, Likert & Seashore proposed a paradigm by which the connection between those systems and performance worked. Still later, in a subsequent publication, Likert (1967) proposed an explanation for the discrepancy: in addition to a number of methodological flaws in approach and measurement methods, the studies listed had failed to take <u>time</u> into account as a variable. Yet another explanation, implicit in Likert's entire approach but not specifically identified, is the observation that performance in a productivity sense is seldom an <u>individual</u> matter. Rather, it occurs in social aggregations, perhaps work groups, but more likely such larger units as departments, cost centers, or even whole organizations.

To examine the effect of time as a variable, Likert began, with Bowers, a large multi-organization study entitled the <u>Intercompany Longitudinal Study</u> (ICLS). (Bowers, 1968) This effort began in 1966, lasted five years, and concluded in 1970. At its conclusion, some 23 organizations had participated in one way or another. The products of the study, by that time and in future years, were:

- an archive of data, containing multiple measurements of human organizational functioning plus performance data over time

- a standardized questionnaire instrument for use in obtaining these measurements (the Survey of Organizations or SOO)

- a body of development technology for obtaining improvements in organization functioning and productivity, and

- an approach to a previously conceptualized field, current value human resources accounting, that had never been operationalized, and

- a large number of publications on the relationship between organizational management practices and processes and performance.

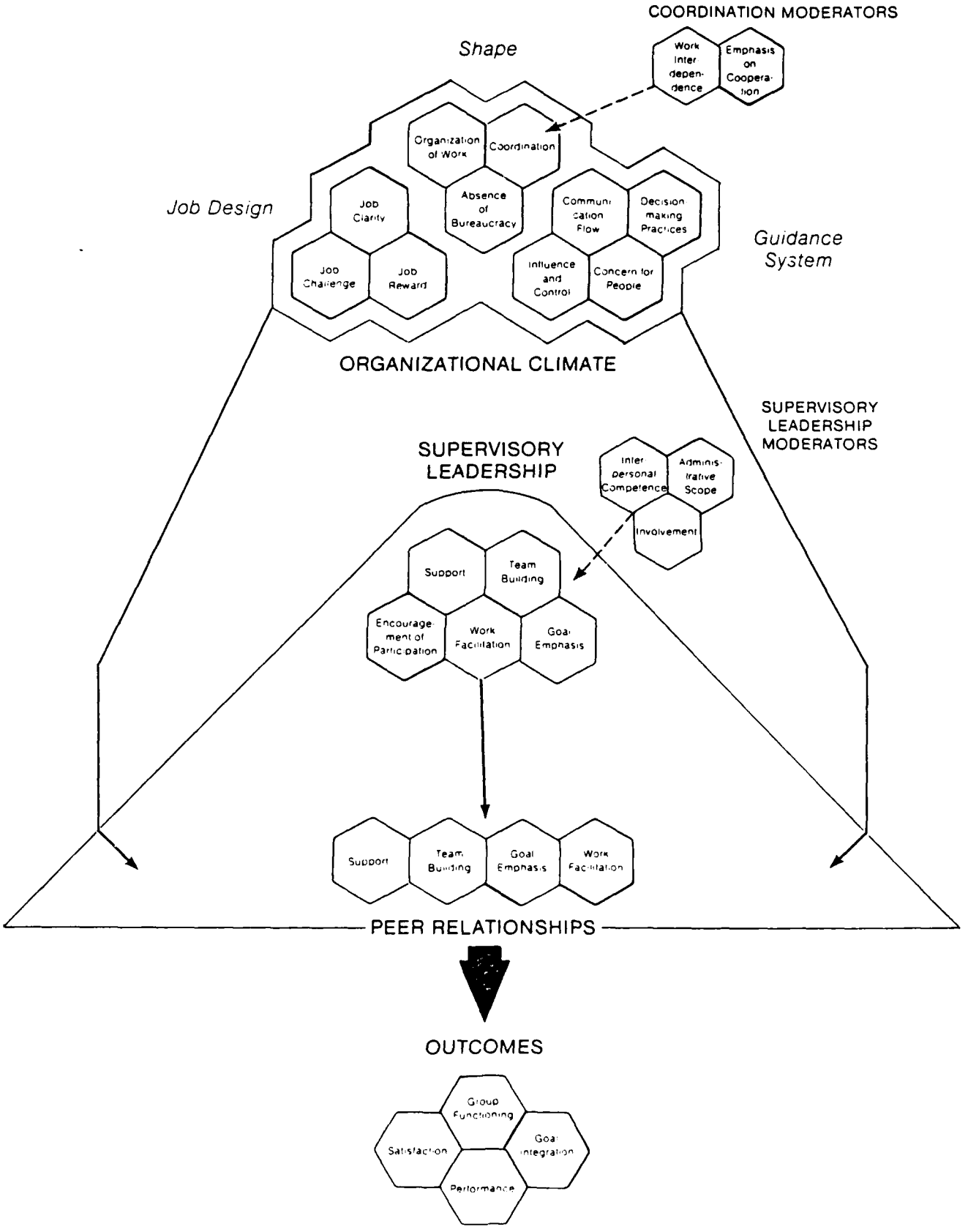
The program of research and development launched by ICLS has continued to this day, a period of 20 years. During that time, the theoretical model that was the original focus has been modified and elaborated, and the measurement method has been improved. The core of the work remains the same, however: human organization systems can be measured and they can be shown to have substantial consequences over time for unit performance. The model in its present form is illustrated in Figure 1-1. It contains several key domains of constructs:

- Organizational Climate - a set of concrete processes or conditions which flow from upper level units and groups and which in part determine the ways in which subordinate units can operate and function.

- Supervisory Leadership - behaviors by a work group's supervisor, in both people- and task-related areas.

Figure 1-1

The Model Underlying The
1980 Survey of Organizations



- Peer Relationships - behaviors by subordinates toward one another in these same general people and task areas.

- Outcomes - end results of the accumulated effects of the above, in both human and performance terms.

The Office of Naval Research played a crucial role in relation to much of the research which flowed from this effort. Beginning in 1968, studies were supported which (a) examined change in organizational systems over time, (b) systematically tested different methodological approaches to organizational diagnosis, (c) examined and tested the feasibility of current value human resources accounting in civilian organizations, and (d) developed a prototype system and examined its results for current value human resources accounting for Navy units. Indeed, it can be said that, if ICLS created the method and structure that permitted the systematic study of time as a variable, ONR made the research possible.

The payoffs to the Navy itself were additional and more direct, however. As the research results began accumulating from ICLS data, in the period 1969 - 1972, it became apparent that they raised both possibilites and concerns that were relevant to the Navy as it approached the period of the all-volunteer force. Were the practices and processes which the research had identified as necessary for effective performance, not to mention satisfaction and morale, important to attracting and retaining personnel? Did young people at that time, considering the upheavals and rejection of traditional forms and practices that were evident in the late 1960's and early 1970's, differ from previous generations in what would attract and motivate them? Accordingly, a national study of these questions was funded by the Manpower R&D Committee, through ONR. As a part of it, the SOO was administered to personnel from a sample of Navy ship and shore units. As the results became available, it became increasingly apparent that the young people from whom the Navy would have to recruit had an even greater commitment

to what could be called an effective human organization environment than did their elders, and that the Navy would in all likelihood have to stimulate the upgrading of practices, processes, and leadership behaviors. In a separate effort, a similar sample of Army units also was surveyed using the SOO, and the Navy and Army results appeared to be highly similar.

This finding coincided with an effort (the Human Resource Management program) then beginning for other reasons, and the Navy Human Resource Management Survey (NHRMS) was created. In form, it followed closely an early edition of the SOO. Although specific indexes were somewhat different, they fell into the areas of Command Climate, Supervisory Leadership, Peer Relationships, and Outcomes. From 1974 to 1984 widespread use of the survey occurred, especially among fleet units, and the data were, as SOO data had been, archived and used in a program of research to support the effort.

Bowers & Ross (1979) reviewed the published, and in some instances only internally (to a Service) distributed, evidence on the relationship of military unit organizational practices to unit performance. The evidence, extending in some instances to pieces published many years earlier, generally supported the ICLS finding that more people-oriented, involvement-generating management and leadership practices were associated with effective performance.

Furthermore, the time factor began to emerge in military organizational research findings, as it had a decade earlier in civilian research findings. Franklin & Drexler (1976), using NHRMS survey data for 271 units, found directionally appropriate coefficients of correlation between organizational practices and both reenlistment rate and operational readiness, rising to six to eight months into the performance future, which was as far in time as their performance data went. Pecorella, Bowers, Davenport & Lapointe (1978), in a study of organizational practices and future performance in cost centers from civilian industry, found coefficients of relationship to absenteeism and cost performance peaking in directionally appropriate ways nine to

18 months into the future. Denison & Bowers (1983) found that the relationships studied earlier by Franklin & Drexler -- of organizational practices to reenlistment rate and operational readiness -- continued to rise out to three and four years into the future (which was as far out in time as their measures carried.) Furthermore, it was estimated that only 50 to 60 per cent of the variance in reenlistment and readiness measures was reliable and valid, and the NHRMS indexes predicted 70 to 80 per cent of that (35 to 50 per cent of overall variance)!

An obvious difference can be noted between the military and civilian studies. Whereas both the Franklin & Drexler study and the Denison & Bowers study had looked at relationships to performance over time for fleet units, which are whole and separate organizations, those in the civilian sector -- specifically Pecorella, et al. (1978) -- had looked at cost centers within organizations. There were, up to that point, several reasons for this:

- Available performance measures for civilian industry are typically set up to monitor internal productivity, whereas performance measures for military units are almost always at the whole unit level.

- Substantial numbers of cases are needed to attain statistical significance. Although this is not a methodological problem in the Navy with hundreds of fleet and shore units, is poses a definite problem in civilian industry. Attaining comparable numbers of whole-company units would pose problems of scale and of the fact that performance measures differ from one company to another. In the Pecorella, et al. (1978) study this had been handled by standardizing each organization's performance data within its own distribution over time and then merging standard scores across companies. Thus variance between firms was lost. Despite this, significant results had been obtained.

There remained, therefore, the question of what relationships to performance would look like if, like Navy Units, whole-organization performance units that were comparable across companies could be attained. Denison (1982) reported a study which at long last addressed this issue. For a sample of publicly held corporations, he correlated SOO indexes with return on sales and return on equity over a period five years into the future. Once more, the coefficients were quite high and, for measures of organizational climate, were either still rising or barely peaking five years into the future.

Finally, Hansen & Wernerfelt (1987) took an enlarged data set from the SOO archive, added to it additional cases from another archive containing at least some nearly identical indexes, and examined the ability to predict return on assets for a five year period. The results indicated that the organizational practices indexes predicted 38 per cent of performance variance (no estimate of what share of overall performance variance could be considered reliable and valid was provided) and twice as much variance as that predicted by measures representing an economic model.

An interesting additional performance finding occurred in a companion research study to the one reported by Denison & Bowers (1983). It was found in Bowers & Krauz (1983) and Bowers, Krauz & Denison (1983) that Project Upgrade rates for fleet units (the rate of occurrence of dysfunctional non-performers requiring discharge) could be predicted from NHRMS data reflecting conditions which had gone on in those units six years earlier -- as much as two complete crew changes and two changes of command earlier, and before the Upgrade cases themselves had even entered the Navy!

It would appear, then, that the question posed originally more than 30 years ago and initially addressed 20 years ago has been conclusively answered. The evidence is simply overwhelming that organizational practices and processes -- the management system of the human organization -- do affect performance, affect it substantially, not just marginally, and have an impact whose effects extend at least five years

into the future, which is as far as research has extended it up to this point. Furthermore, it would appear that the management system and leadership style which works best in terms of subsequent performance is one which is more human in its orientation, more involving, and more participative (less autocratic), and that all of the above -- impact upon future performance and what system works best -- is as true for military units as it is for civilian industry.

Other Research on Effective Performance Over Time

It is also worth noting that during the time span when the research cited above was being conducted, the classic problem in organizational behavior and organizational theory remained the inability of nearly all studies to predict the performance of organizational units over time. Several studies have examined the impact that organizational characteristics have on performance and effectiveness at a single point in time, (Lawrence and Lorsch, 1967; Khandwalla, 1973; Glisson and Martin, 1980; Goodman, 1979) but most of these have concentrated on organizational design, structure, and centralization as predictors of performance. To our knowledge, there have been no multi-unit, longitudinal field studies of the relationship between behavioral characteristics of business organizations and performance over time. One study currently in progress (Denison, 1987) will soon report on a three-year longitudinal study of 20 business units in one corporation in which both survey and performance measures were collected for each unit in each year.

Research conducted on organizational effectiveness has also evolved and matured over the time period cited above. Empirical research has provided clear support for the complexity of the effectiveness construct (Seashore and Yuchtman, 1967; Cameron, 1978), and has emphasized a perspective that combines the interests of multiple stakeholders and the use of multiple measures. With the exception of the research on educational institutions by Cameron (1978; 1986), however, this literature has made

little contribution to understanding the impacts that organizational behavior and human resource management have on effectiveness. The organizational effectiveness research has made many conceptual contributions (Cameron and Whetten, 1983), but few empirical advances.

Climate and Culture Research

The survey measures used in this study fit best within the domain of organizational climate in the research literature. Climate has a long tradition of research beginning in the 1960s (Taguiri and Litwin, 1968; Guion, 1973; James and Jones, 1974; Payne and Pugh, 1976; Woodman and King, 1978) and continues to be an area of research and controversy to this day. (Joyce, 1988, Glick, 1988). This literature has had as its primary concern issues of conceptualization and measurement, and has shown paid little attention to the impacts of climate or the prediction of organizational performance. The literature remains divided between those who treat climate as primarily a psychological concept and those who treat climate and the derived measures as indicators of relatively stable characteristics of social systems. Despite these long-standing disagreements, survey-derived climate measures retain a safe status in the organizational literature as one indicator of the behavioral character of an organization's management system.

More recently, a great deal of attention has been paid to a related concept, organizational culture. (see Denison (forthcoming) for a more extensive comparison between the climate and culture concepts) One of the primary differences between culture and climate has been methodology. Culture has been most often studied from a qualitative, historical, and phenomenological perspective, while culture has, in nearly all instances been studied in quantitative and comparative terms. The emphasis, particularly in the academic literature, has been on understanding the meaning that organizational members attribute to an organization and the process of socializing of new organizational members. Perhaps the primary substantive difference between the two

concepts is that culture is thought to be a more enduring historical aspect of an organization, and a product of the organization's evolution, not prior management actions.

Nonetheless, many of the arguments made by the culture literature both academic (Ouchi and Wilkins, 1983; Martin, et al. 1984) and popular (Kanter, 1983; Peters and Waterman, 1982; Peters, 1987) (with primarily qualitative evidence) are very similar to those made by the climate literature. Involvement, adaptation, and the link between the individual and the organization are common themes in both literatures, and have been strongly emphasized in culture research. One intriguing example from the culture literature which has not appeared in earlier climate research is what might be called the "strong culture" hypothesis; that strong and consistent cultures, which convey meaning to organizational members is an asset, and should, over time, be associated with more effective organizational performance. This issue is quite similar, however, to a longstanding tradition of research on normative integration, (Seashore, 1954; Georgopoulos, 1987). By using variance scores as predictors, there is some evidence that lack or variation, or consistency, can be a predictor of effectiveness. Denison (1982) study found that consistency was a good predictor of performance short-term, but that it was inversely related to effectiveness in the longer term.

Nature of the Present Research

The findings summarized above raise an intriguing, if perplexing, question. Stated most simply, it is the following: how can effects like those which occur take place when actors -- in Navy units all actors -- change, at least once if not two or three times, during the period? Nor can it be policies which cause the effect, since, in the Navy, policies are presumably standard for all units, yet performance differs by unit over time, and in civilian industry policies vary from firm to firm, yet the same effect is observed.

In concise terms, the present research proposes to (a) extend performance even further out in time and see whether the effects continue, and (b) examine an conceivable transmission process called the "Constancy-Velocity" hypothesis. Basically, this proposes the following explanation:

1. Over time, what is customary in experience becomes what is valued. Thus, exposure to consistent organizational practices and behaviors for some period of time tends to become what we want and what we consider to be right, good, and appropriate. This, in turn, tends to direct our behavior in the future. In the present instance, climate (and behavior) create a culture (of what is seen as "the correct way to do things"), which in turn causes (or at least strongly influences) future climate and behavior. Newly arriving individuals, according to this argument, rarely have a major impact as individuals in dramatically changing the way things are done, but are much more themselves socialized to the existing "system".

2. A causal flow of Organizational Climate to Supervisory Leadership to Peer Relationships to Outcomes drives that outcome called "performance", much as research has shown that it does. It takes time for causal impact to occur, however, so that organizational climate -- at the start of the causal stream -- must surge through supervisory leadership and then peer relations to have its effect. Thus, in the causal flow, peer relations ought relate most strongly (have their relational "peak") in a period immediately ahead; supervisory leadership ought have its peak in some intermediate time period, while climate -- at the start of the chain, ought peak farthest out into the future. Indeed, there was some suggestion of precisely this effect in the findings of Denison (1982).

3. However, in addition to causal flow and its natural time requirements, the Constancy-Velocity argument holds that it is the socialization process which

accounts for the transmission of effects across complete changes of personnel in a unit. The ability to predict Upgrade rates for fleet units across strangely long periods is consistent with this. From the case studies documented in Bowers, Krauz & Denison (1983), it was apparent that the typical Upgrade case was a person who, starting out on an even keel in the Navy, had deteriorated to the extent that the management style of the unit was autocratic or highly directive. The Constancy-Velocity hypothesis would say that there is, in the recruit population some percentage of persons who are unable to function in such environments. Confronted with them for some period of time, they go "over the edge." When a command has a climate of relatively autocratic, directive practices, it does two things: (a) it literally pumps more people through the system because of lower reenlistment rates, higher UA/desertion rates, etc ("higher velocity"), and (b) also creates the conditions likely to turn the vulnerable into Upgrade cases.

It is proposed, therefore, that poorly managed units have climates and cultures which demotivate and alienate. One result of this is poor performance as measured by common indicators: high rates of non-judicial punishment and unauthorized absence, lower reenlistment rates, and reduced unit readiness. As crew members are, in effect, "lost" through the personnel-related conditions which these measures reflect, they must be replaced. Over time, therefore, a poorly managed unit will have a greater absolute flow of persons through the unit. If one then acknowledges the above-mentioned proportion of person who may be termed "Upgrade vulnerable", a higher number of such individuals will be present. At the same time, the poor practices which have created this greater personnel velocity, having been perpetuated, serve also to trigger the disintegrative behavior of Upgrades.

Well managed units, on the other hand, present an opposite pattern. Effective management practices result in a reduced personnel velocity, lower absolute numbers of Upgrade vulnerables, and as transmitted perpetuation of practices which tend to prevent the triggering. Schematically, the flow would be as it is depicted in Figure 1-2.

This model suggests the following testable general propositions:

- Organizational practices, climate, and culture tend to be transmitted over relatively long time periods, including several changes in command and changes of the ship's complement.

- Personnel velocity results from the replacement of losses incurred as a result of low reenlistment rates, reenlistment for reassignment, unauthorized absence, non-judicial punishment, and the like, which are themselves the result of organizational practices and conditions.

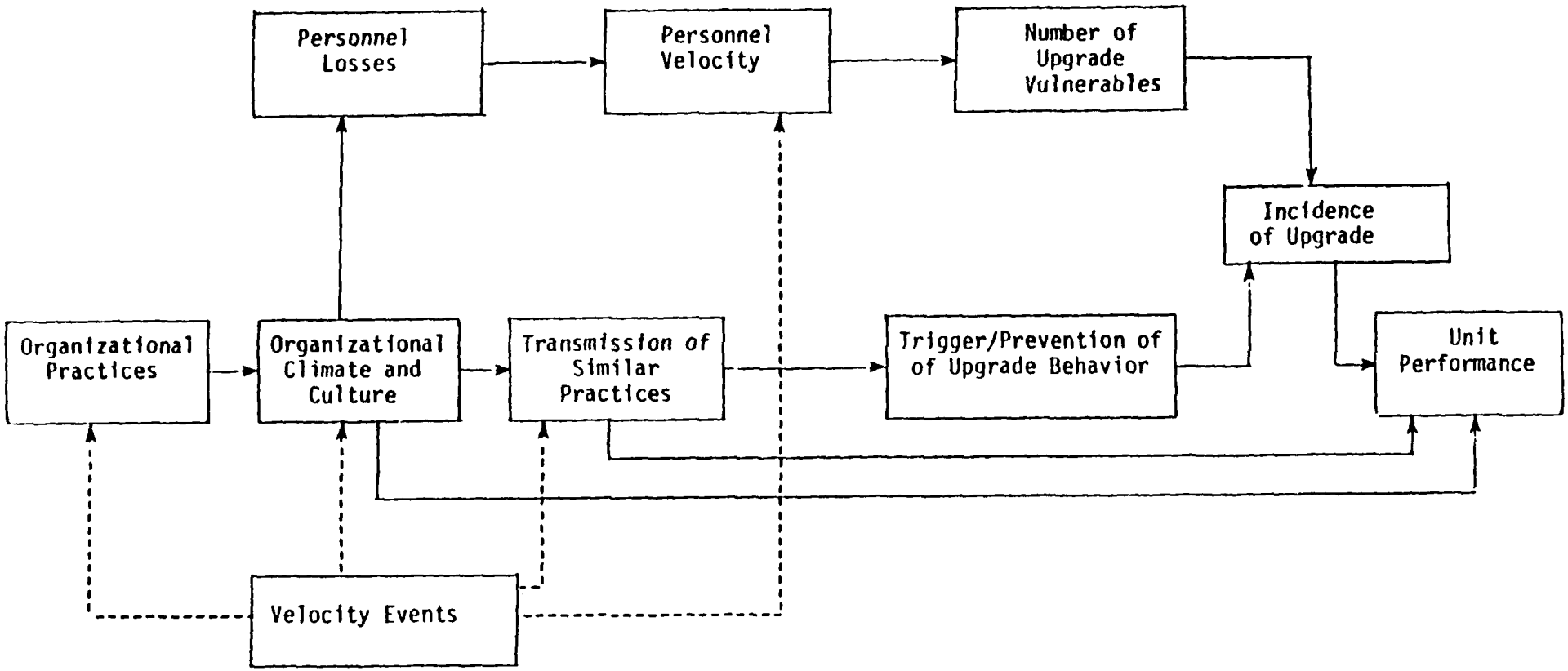
- Units with high velocity, but which have for some reason experienced a positive interruption of the climate-culture transmission, will have lower Upgrade rates than similar high velocity units whose negative practices have been transmitted, but higher Upgrade rates than low velocity units.

- Unit performance will be impacted by the joint effects of transmitted practices and conditions and personnel velocity.

- Possible "velocity-impacting" events, such as changes of command, deployments, and overhaul may impact organizational practices, the resulting climate and culture, or personnel velocity directly, thereby altering downstream consequences, or they may have little impact.

Figure 1-2

Constancy-Velocity Explanation:
Network of Hypothesized Effects



Chapter II
The Sample, Measures, and Methods

The research proposal had listed the information that was expected to be collected for units contained in the earlier study's sample. That information was:

- Indicators of unit culture.
- Direct measures of personnel velocity.
- Critical events data.
- Additional performance data (extended out in time).

Privately, however, it was hoped that the two waves of NHRMS survey data could be augmented for the units in the sample, especially in years prior to 1978, and that perhaps additional units could be added to the sample, once more, those with two waves in earlier years than 1978. The first of these met with partial success, as will subsequently be shown, but the latter proved to be totally impossible. Use of the NHRM survey was discontinued about the time that this present project began, and its research support and archiving arm at the Navy Personnel Research and Development Center was disbanded. All tapes of survey data, plus documentation, were boxed and sent to storage at the Washington Navy Yard. Although tapes of some sort were located, most of them proved to be unreadable, given a lack of any documentation or dictionaries. One tape, containing approximately 50 units from the earlier study's sample was located and a dictionary which the Principal Investigator had saved from the earlier study permitted it to be read. It proved especially valuable, since the survey data contained in it are from the years preceding 1978 and permitted us to look at long-wave effects over a period of 10 to 12 years.

The Sample

As indicated above, the sample used in this study was that of the previous effort (Denison & Bowers, 1983). It included all units with two or more waves of NHRMS data collected from July 1, 1978 until August 1981. It included 67,100 respondents from 174 fleet units (ships and aviation units), and was originally provided to the research staff by the Navy Personnel Research and Development Center. The sample appears to be highly representative of the fleet as a whole, at least as it was configured in 1983. Documentation of representativeness tests were included as Appendix A of the report cited above.

The survey measures for this study and the previous study were drawn from the Navy Human Resource Management Survey (NHRMS), an 88-item paper and pencil questionnaire administered to a unit as a first step in a human resource development cycle. The survey was used extensively between 1974 and 1984. The items combine to yield 23 key indexes. The items and the alpha coefficients for the indexes also were presented in Appendix A of the earlier report.

Performance Measures

Unit performance measures were collected for as many of the units as possible and calculated in either semi-annual periods or calendar year quarters to achieve the necessary criterion stability. (For a discussion of that issue, see Drexler & Franklin, 1976.) Since the lagged effects upon performance which were the subject of this present study had occurred especially for reenlistment and readiness (FORSTAT), effort to add to the file of performance data was limited to those two measures. Other performance data remain as they were for the previous study. The performance measures included in the present study, therefore, were:

Reenlistment — First-term reenlistment: number of first-term reenlistees, divided by number eligible. Total reenlistment: number of overall reenlistees, divided by overall number eligible.
Quarterly, from 7/78 to 12/86.

Readiness(FORSTAT)
Five measures: Overall, Personnel, Equipment & Supplies, Equipment, Training.
Quarterly, from 7/78 - 9/86.

Unauthorized Absence
Number of unauthorized absences, divided by the E1-E7 complement for the unit.
Semi-annually, from 10/78 to 10/81.

Desertion — Number of desertions, divided by the E1-E7 complement for the unit.
Semi-annually, from 10/78 to 10/81.

Non-Judicial Punishment
Number of NJP's and civil convictions, divided by the E1-E7 complement for the unit.
Quarterly, from 7/78 to 9/82.

Drug and Marijuana Offenses
Number accused of drug offenses, divided by the E1-E7 complement for the unit.
Quarterly, from 7/78 to 9/82.

Upgrade Rate — Number of persons discharged in the first and second waves of Project Upgrade, divided by the E1-E7complement for the unit.
Calculated for Upgrade I, Upgrade II, and I and II combined.

All of these performance measures except Upgrade Rate were first standardized within periods to control for the effects

of seasonal and yearly variation. Each unit was therefore given a standard score that reflected its standing in relation to all other units within a given time period. The performance measures were then relativized with respect to the date when Wave 1 HRMS survey data were collected.

Velocity Measures

Independent, direct measures of velocity were calculated from the Enlisted Master Tape for the years 1980-1985 (as far back as data were available). Separate measures were calculated for 1980-1982 and 1983-1985, then an overall velocity measure was calculated by averaging the measures for the two component periods. Using SSN, the following procedure was employed:

- Unit velocity = (Sum of personnel on board Year 1, plus ADDS year pair 1 and 2, plus ADDS year pair 2 and 3), divided by the average population Years 1 - 3 for units of that type.

- Type velocity = Unit velocity, divided by the average unit velocity for units of that type

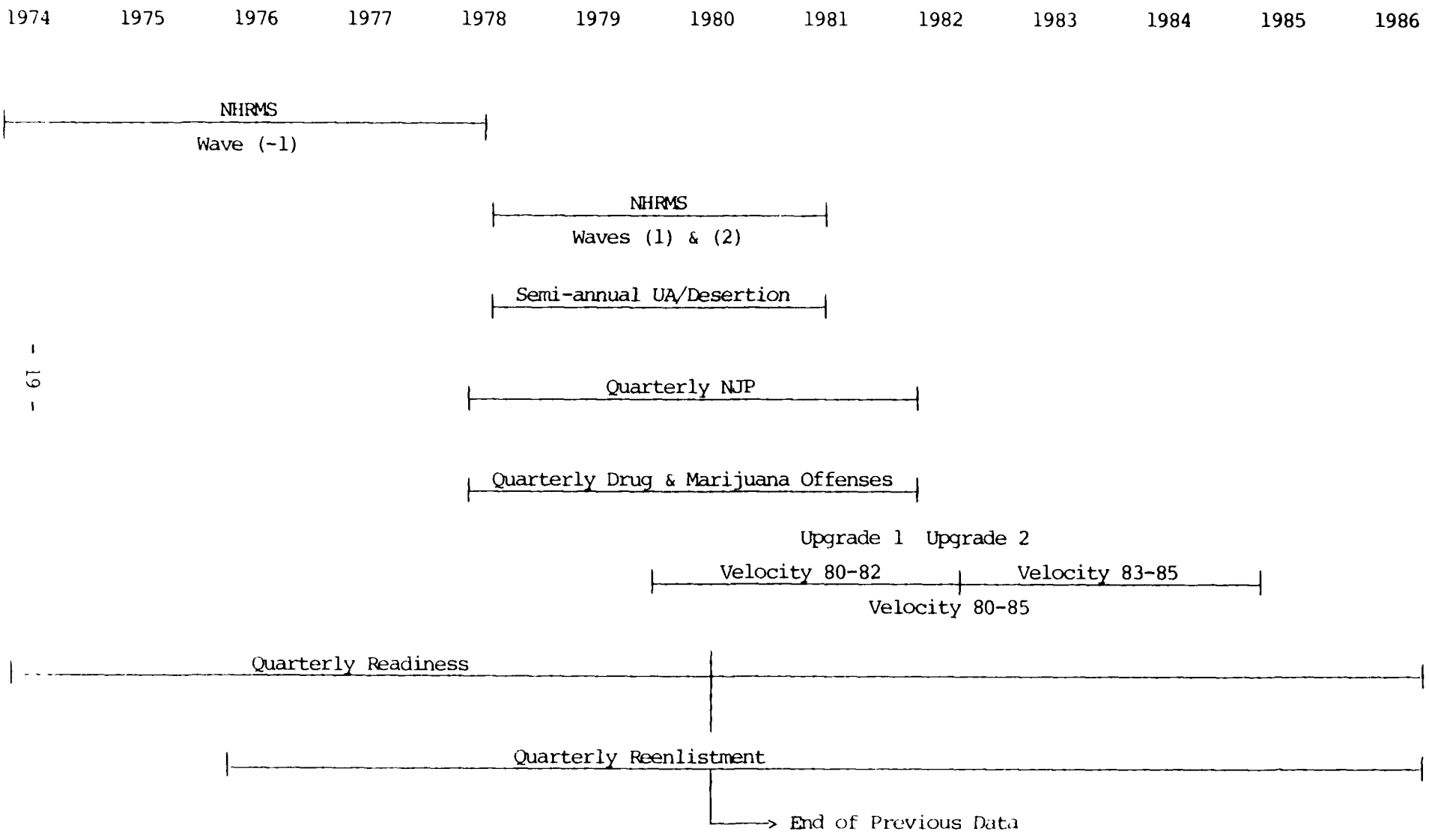
Dates for the survey and performance measures are shown in real time in Figure 2-1.

Critical Events

After much discussion and consideration, it was decided to add data concerning three kinds of critical events that could conceivably impact the human organization's functioning, performance, velocity, or any combination of the above. For both ships and aviation units, data were collected for the period 1974 - 1986 on changes of command and periods of deployment. For ships only, data were also collected on periods of overhaul. Access to histories for ships was provided by the Ships' Histories Section of the Naval Historical Center; access to histories for aviation units was

Figure 2-1

TIMELINE OF DATA



dates was a matter of weeks of reading annual histories and extracting dates from variously written prose. The resulting information was coded in relation to the date of the NHRM survey waves. For each wave, the following was coded:

- Months since last change of command.
- Months since deployment.
- Months deployed since last survey.
- Months since overhaul.
- Months in overhaul since last survey.

The 12-Year Subsample

The readable tape mentioned above produced a 55-unit subsample of the 174 units, having an earlier wave of NHRMS data om the years 1974-76. This subsample was then the subject of longer wave analyses.

Analysis Methods

Relationships to reenlistment and readiness measures were examined by the use of multiple regression techniques. Possible impact of Velocity was tested in this manner as well, plus by the use of analysis of variance. Critical Events data were examined by zero-order correlation with both NHRMS and performance data, plus, to check for non-linear relationships, by the use of multiple classification analysis. Finally, the interplay of Climate and Culture over time was examined by the use of cross-lag correlation.

Chapter III
Long-Wave Effects in Organizations

In this section of the report, we test what must be regarded as the most fundamental proposition of all, that there are long-wave connections over time between organizational climate and culture on the one hand, and unit performance on the other. The specific proposition was worded as follows:

> ***Organizational practices, climate, and culture tend to be transmitted over relatively long time periods, including several changes in command and changes of the ship's complement.***

In the remainder of this and subsequent sections of the report, we will use the term climate, not in the narrow sense of basic processes, but in the broader sense of behaviors and processes ongoing in the unit. As indicated in the previous section of the report, they are measured by means on the indexes of the Navy Human Resource Management Survey. The term culture, on the other hand, is used to refer to the closeness or tightness -- the consensus -- which exists around those means, and is measured by the standard deviations for those same indexes.

Reenlistment rate and readiness (FORSTAT) data were available for 32 calendar quarters and 29 calendar quarters subsequent to the time of the Wave 1 NHRMS survey. In real-time terms, Wave 1 NHRMS occurred during approximately the years 1978-1980, while the performance data run from 1978 to 1986.

As in the previous study, organizational climate, supervisory leadership, and work group (peer) behavior were combined into

three "super-indexes" by averaging index means. They were joined by:

131 Fair and Equitable Treatment
145 Work Group Discipline
146 Satisfaction
147 Lower Level Influence
148 Training
149 Equal Opportunity

Constancy in Climate and Culture

A first issue was whether Climate and Culture themselves were reasonably constant over the three survey Waves involved (Wave -1 in 1974-76, Wave 1 and Wave 2 in 1978-81. Table 3-1 presents intercorrelation coefficients for the Climate super-indexes across the three waves of survey data. Table 3-2 presents similar coefficients for Culture super-indexes. The data show that both Climate and Culture indexes are quite consistent across the survey waves, and that the pattern for the whole sample is quite similar to that for the smaller subsample.

Predicting Reenlistment Rate

These nine predictors were combined in multiple regression analyses, predicting First-term Reenlistment Rate and Total Reenlistment Rate for each of the 32 calendar quarters. The following figures present the multiple correlation coefficients indicated; except as indicated, all are significant at or beyond the five per cent level of confidence, often far beyond that level:

Figure 3-1 Wave 1 climate means predicting reenlistment

Figure 3-2 Wave 2 climate means predicting reenlistment

Figure 3-3 Wave 1 culture SD's predicting reenlistment

Figure 3-4 Wave 2 culture SD's predicting reenlistment

TABLE 3-1

INTERCORRELATION OF CLIMATE INDEXES ACROSS SURVEY WAVES

	Organizational Climate Wave -1	Organizational Climate Wave 1	Organizational Climate Wave 2
Organizational Climate 1	.53		
Organizational Climate 2	.46	.66 (.69)	
	Supervisory Leadership Wave -1	**Supervisory Leadership Wave 1**	**Supervisory Leadership Wave 2**
Supervisory Leadership 1	.62 (36)		
Supervisory Leadership 2	.58	.76 (.75)	
	Work Group Wave -1	**Work Group Wave 1**	**Work Group Wave 2**
Work Group 1	.62		
Work Group 2	.61	.69 (75)	

Note: Coefficients in parentheses are for the larger, 174-unit sample.

TABLE 3-2

INTERCORRELATION OF CULTURE INDEXES ACROSS SURVEY WAVES

	Organizational Climate Culture Wave -1	Organizational Climate Culture Wave 1	Organizational Climate Culture Wave 2
Organizational Climate Culture 1	.17		
Organizational Climate Culture 2	.47*	.49* (.55*)	

	Supervisory Leadership Culture Wave -1	Supervisory Leadership Culture Wave 1	Supervisory Leadership Culture Wave 2
Supervisory Leadership Culture 1	.28*	.33* (.34*)	
Supervisory Leadership Culture 2	.33*		

	Work Group Culture Wave -1	Work Group Culture Wave 1	Work Group Culture Wave 2
Work Group Culture 1	.34*		
Work Group Culture 2	.63*	.42* (.34*)	

Note: Coefficients in parentheses are for the larger, 174-unit sample.

*Significant at or beyond the five percent level of confidence.

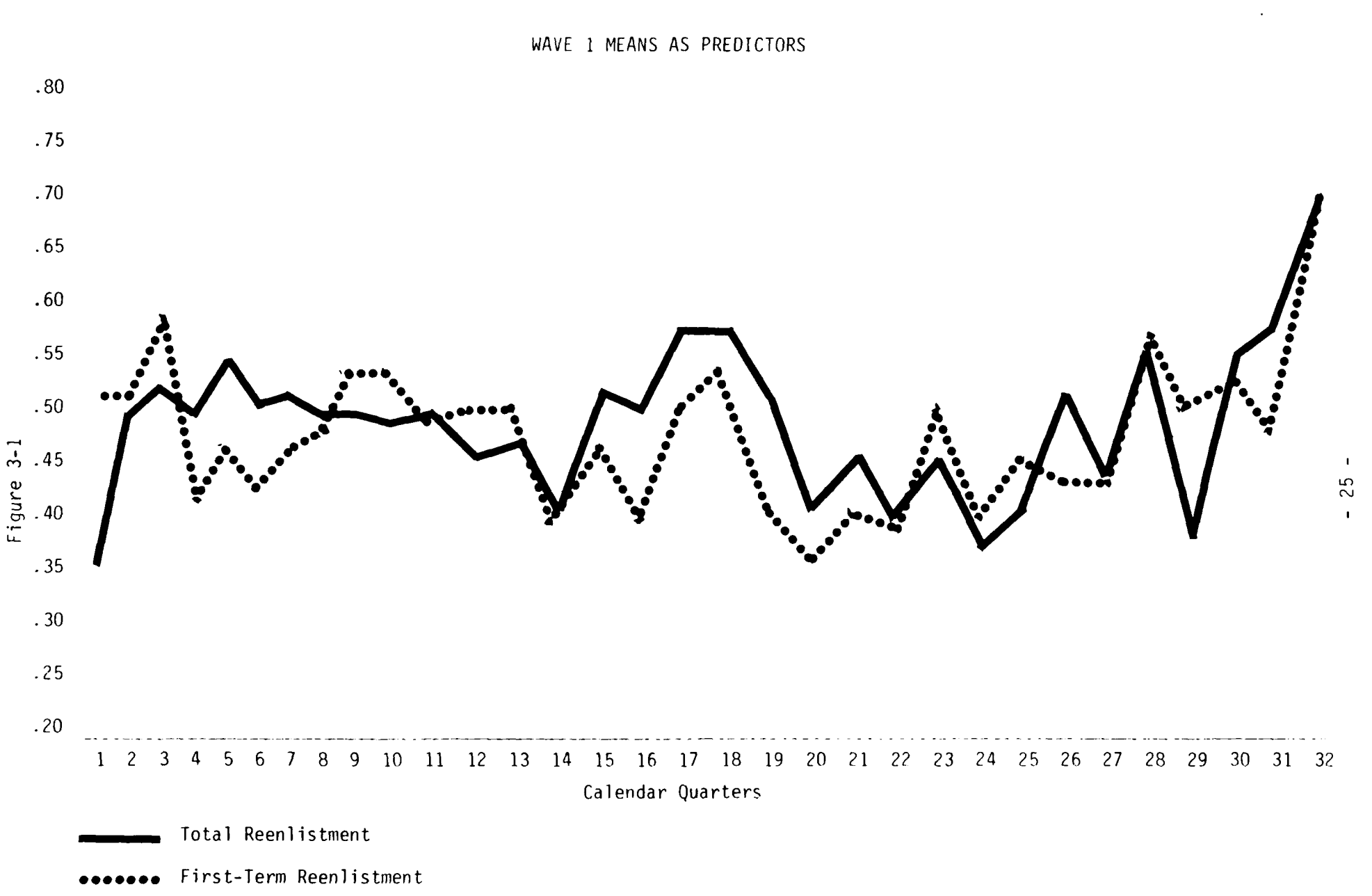

WAVE 1 MEANS AS PREDICTORS
.80
.75
.70
.65
.60
.55
.50
.45
.40
.35
.30
.25
.20
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Calendar Quarters
Total Reenlistment
First-Term Reenlistment

Figure 3-1

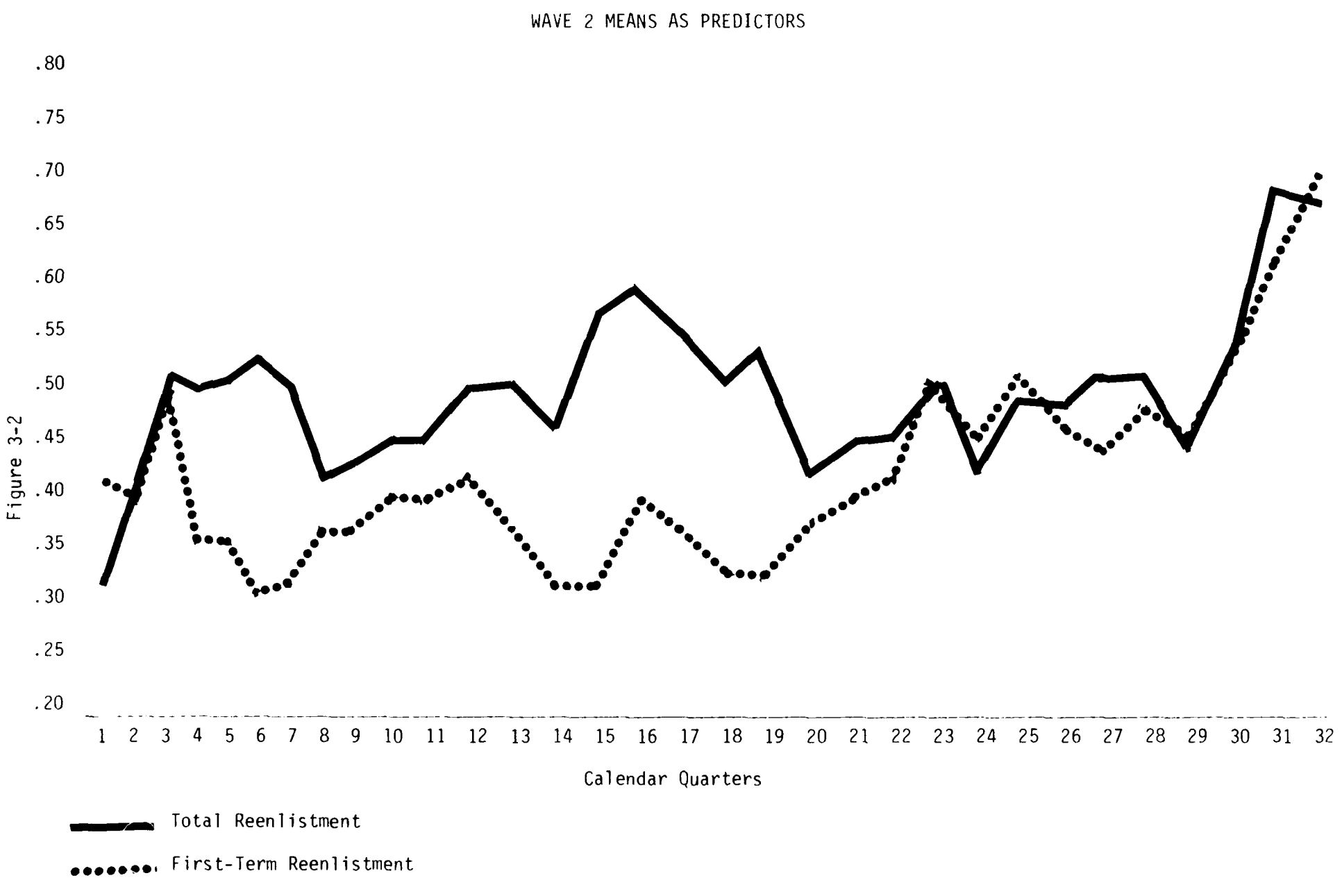

WAVE 2 MEANS AS PREDICTORS
.80
.75
.70
.65
.60
.55
.50
.45
.40
.35
.30
.25
.20
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Calendar Quarters
Total Reenlistment
First-Term Reenlistment

Figure 3-2

WAVE 1 STANDARD DEVIATIONS AS PREDICTORS

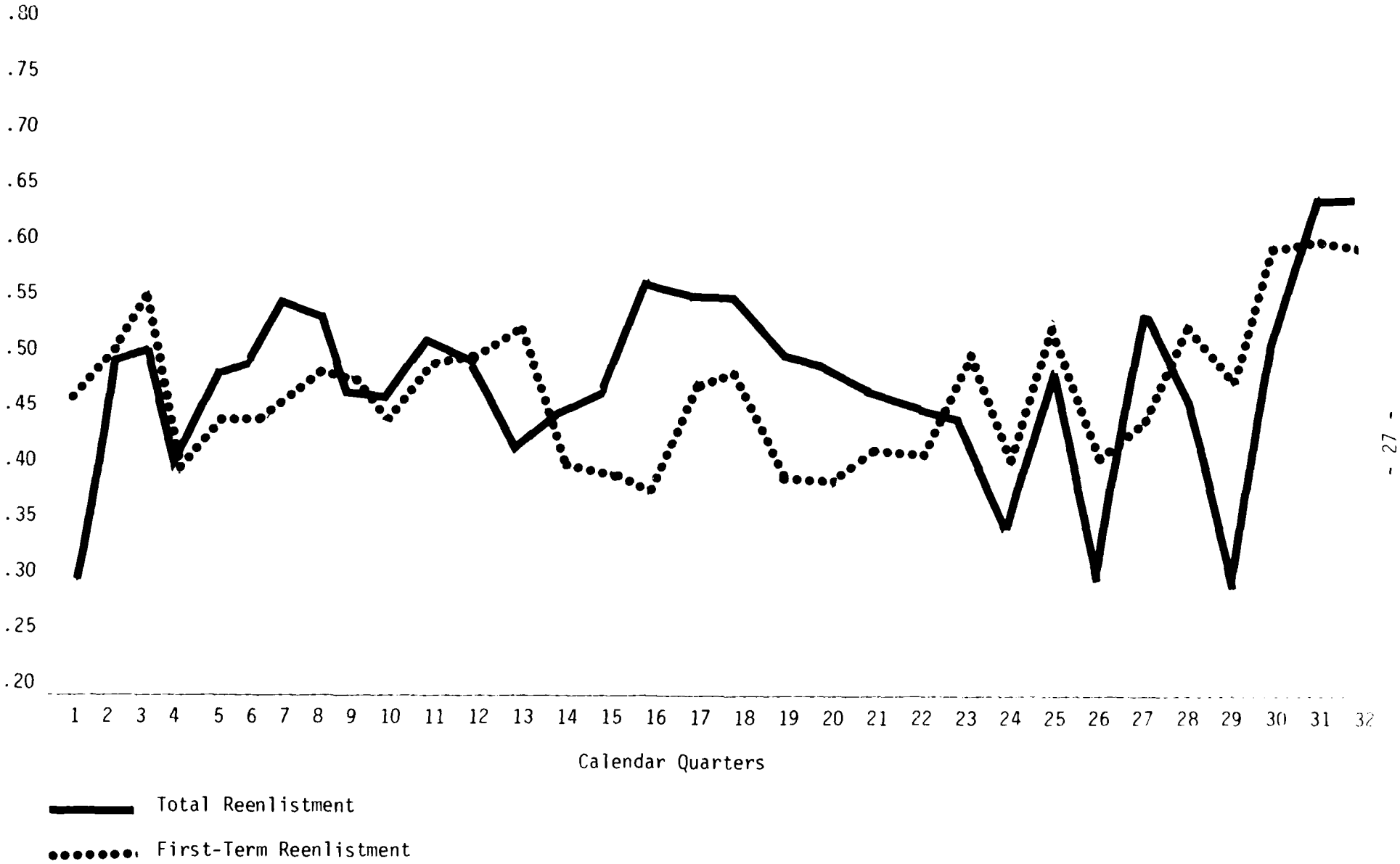


Figure 3-3

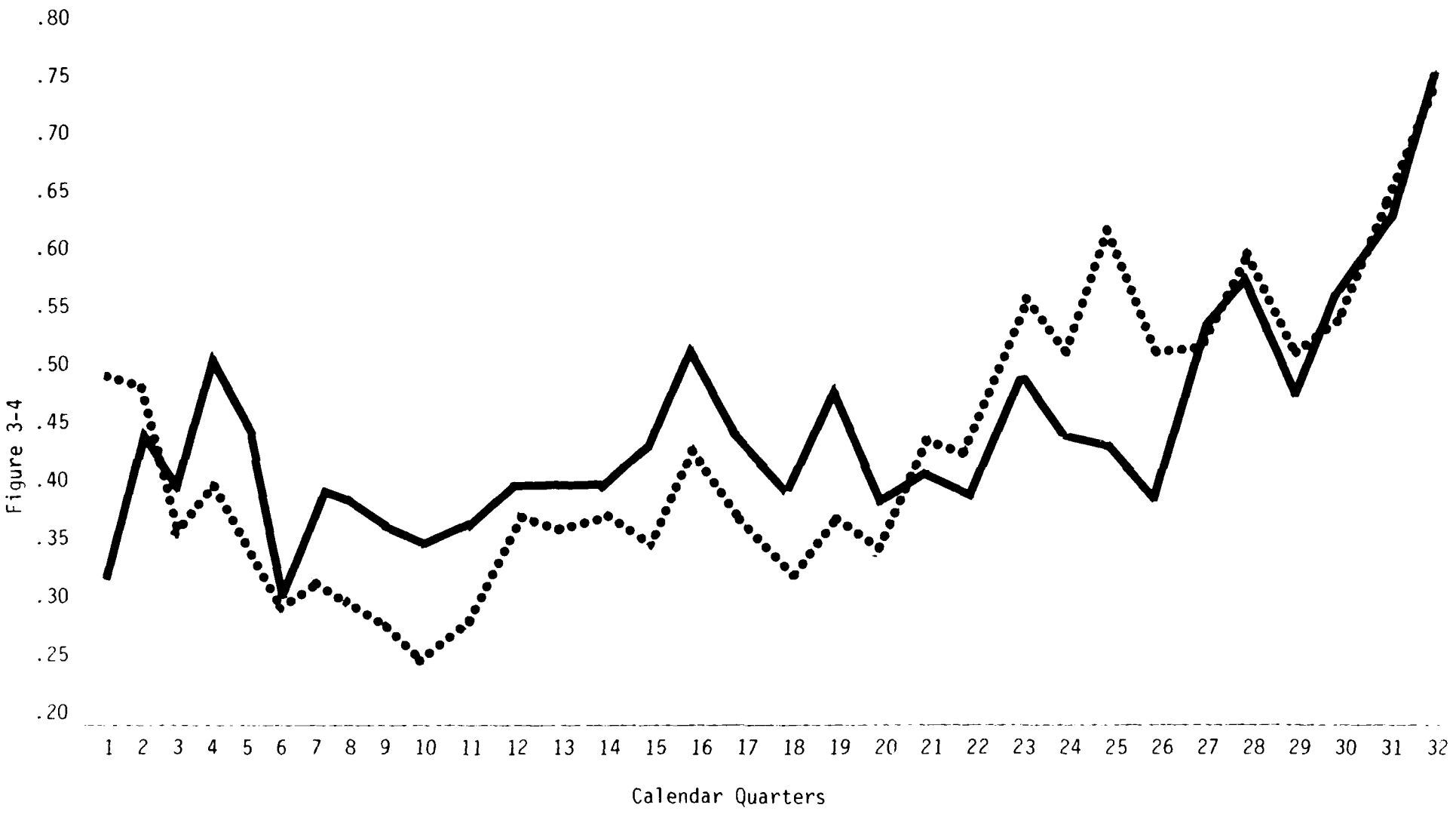

WAVE 2 STANDARD DEVIATIONS AS PREDICTORS
.80
.75
.70
.65
.60
.55
.50
.45
.40
.35
.30
.25
.20
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Calendar Quarters
Total Reenlistment
First-Term Reenlistment

Figure 3-4

The coefficients themselves are presented in table form in Appendix A.

The result indicate the following:

- Wave 1 Climate and Culture do essentially the same job in predicting first-term reenlistment over the eight year period (mean R = .47 in each instance). However, Wave 1 climate and culture do a better job than Wave 2 climate and culture (.47 vs .41, .47 vs .40) in predicting it. While these differences may at first seem small, they amount to five-six per cent predicted variance differences on a predicted variance base that varies from 16 to 22 per cent.

- For total reenlistment, the findings are only slightly different. Climate and Culture do once more essentially the same job in predicting total reenlistment over the eight year period (mean R = .48 in each instance). However, Wave 1 Culture does a better job than Wave 2 Culture in predicting total reenlistment (mean R = .48 vs .44). Again, although the difference may seem small, it amounts to seven per cent more predicted variance on the 16 and 23 per cent predicted variance base.

The Twelve-Year Subsample. Multiple correlations were also obtained to reenlistment rate over the 32 calendar quarters for the subsample which had an earlier wave of NHRMS data in the 1974-76 period. Coefficients are presented in Appendix A. Although 50+ units are contained in the survey sample, only 30-35 had no missing performance data and were included in these multiple regressions. Because of this very small sample size, only a portion of the coefficients were statistically significant. Where they attained substantial size, however, they were statistically significant, and over the entire 32-quarter period averaged almost the same identical level as that for the much larger two-wave sample

(.48 and .44 vs .40 to .49 for the larger sample). In addition, the Culture predictors do a substantially better job than do the Climate ones in this twelve-year subsample. This is at least consistent with the notion that, over the longer haul, it is culture which drives subsequent practices and, through it, performance.

Reenlistment Rates Over Time. An intercorrelation matrix for reenlistment rates over the 32-quarter period is also presented in Appendix A. It shows that these rates are significantly consistent over this time period.

Taken together, these findings suggest that an interwoven pattern of Climate and Culture lead, over a period of time, to reenlistment rates that tend to persist across a decade or more.

Predicting Readiness (FORSTAT)

The same predictors and the same methods were used to predict readiness as to predict reenlistment rate. Nine predictors -- the three domain "super indexes" plus the six other measures -- were combined in multiple regressions predicting readiness ratings over 29 calendar quarters. To simplify the analyses, only Overall Readiness, Personnel Readiness, and Training Readiness ratings were used. The remaining two -- Equipment Readiness and Supplies Readiness -- were disregarded as largely extraneous to the present research purpose.

As before, actual multiple regression coefficients are presented in Appendix A. The data are presented graphically in the following figures:

Figure 3-5 Wave 1 Climate means predicting Overall, Personnel, and Training Readiness.

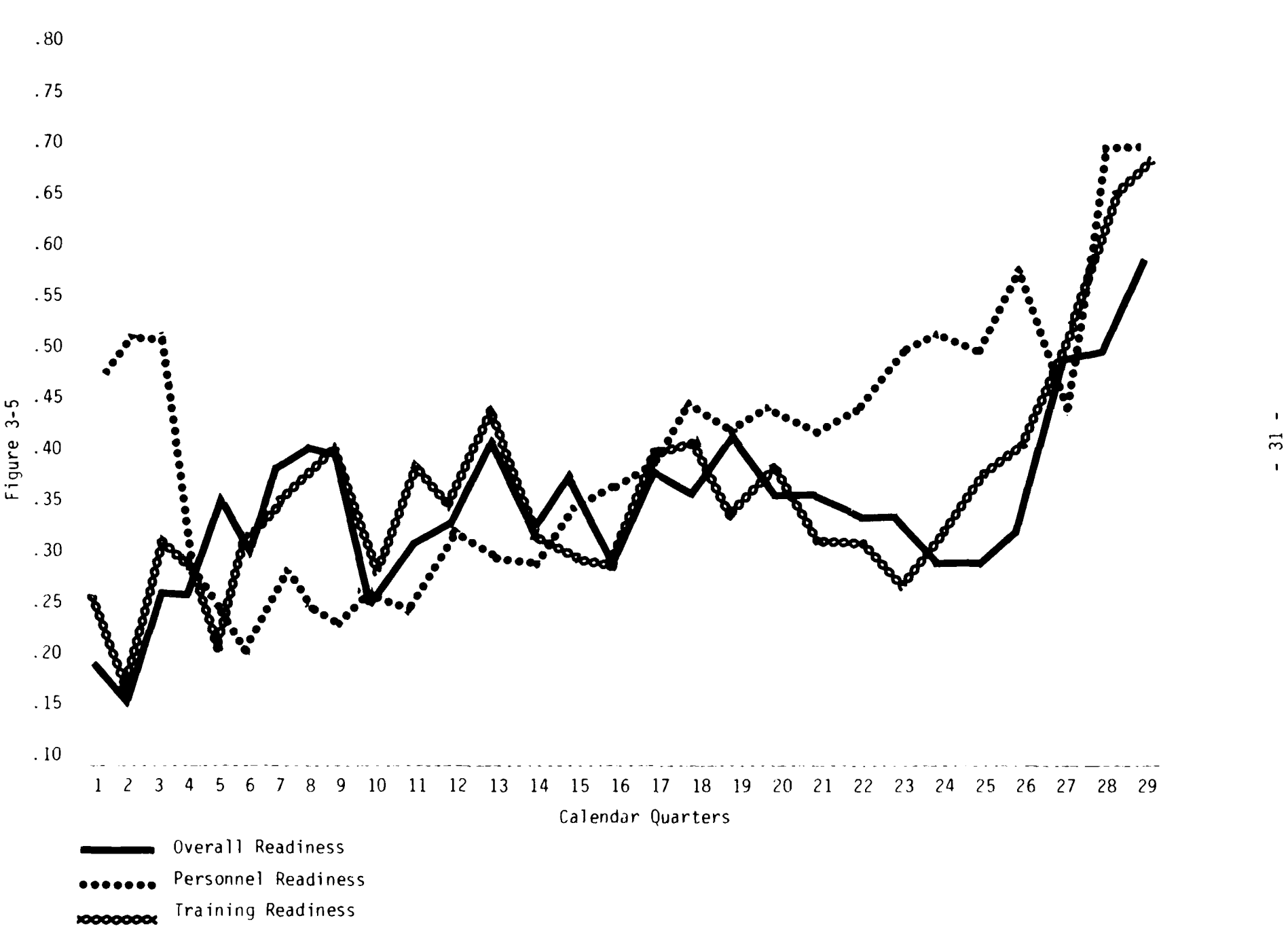

WAVE 1 MEANS AS PREDICTORS
.80
.75
.70
.65
.60
.55
.50
.45
.40
.35
.30
.25
.20
.15
.10
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
Calendar Quarters
Overall Readiness
Personnel Readiness
Training Readiness

Figure 3-5

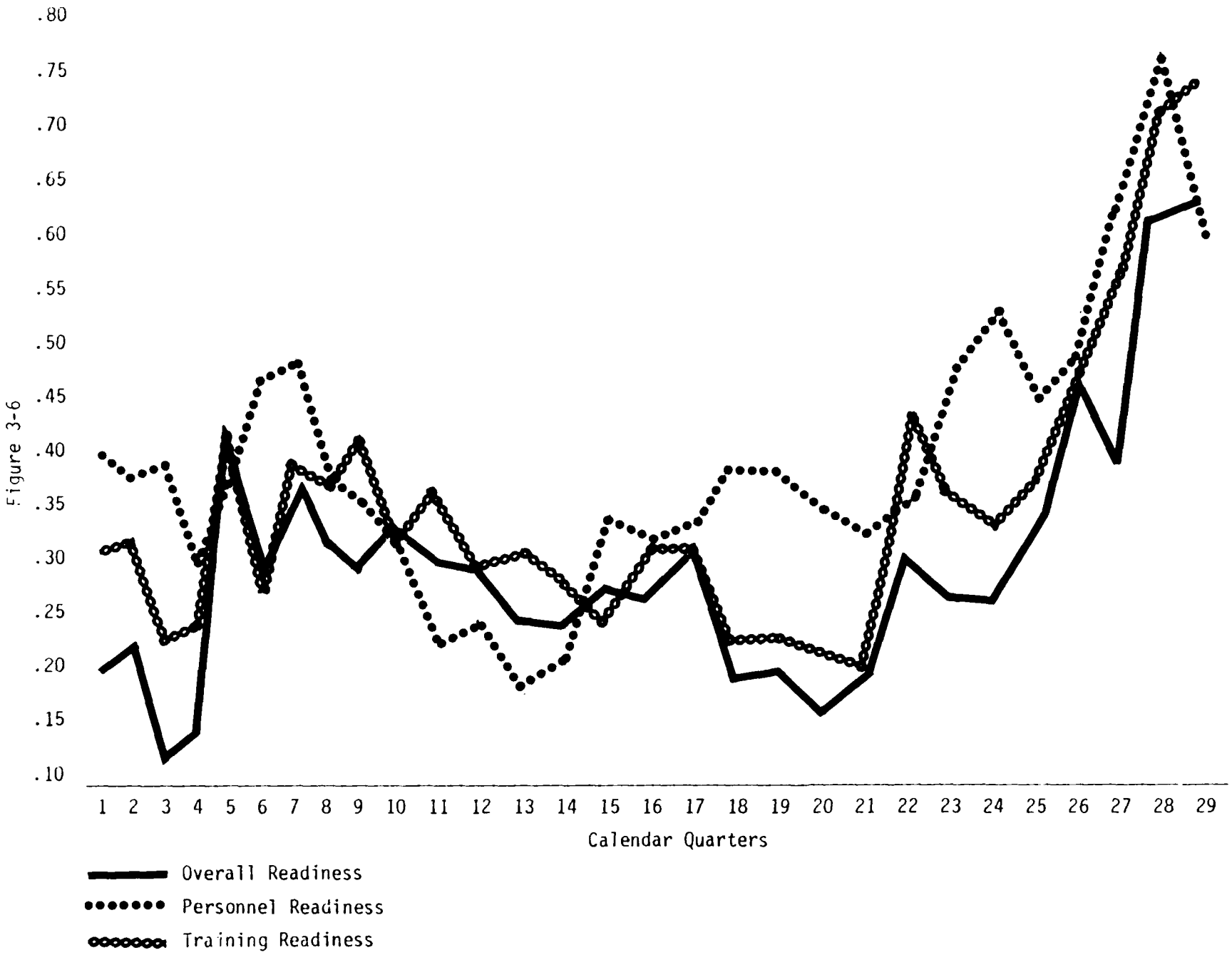

WAVE 2 MEANS AS PREDICTORS
.80
.75
.70
.65
.60
.55
.50
.45
.40
.35
.30
.25
.20
.15
.10
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
Calendar Quarters
Overall Readiness
Personnel Readiness
Training Readiness

Figure 3-6

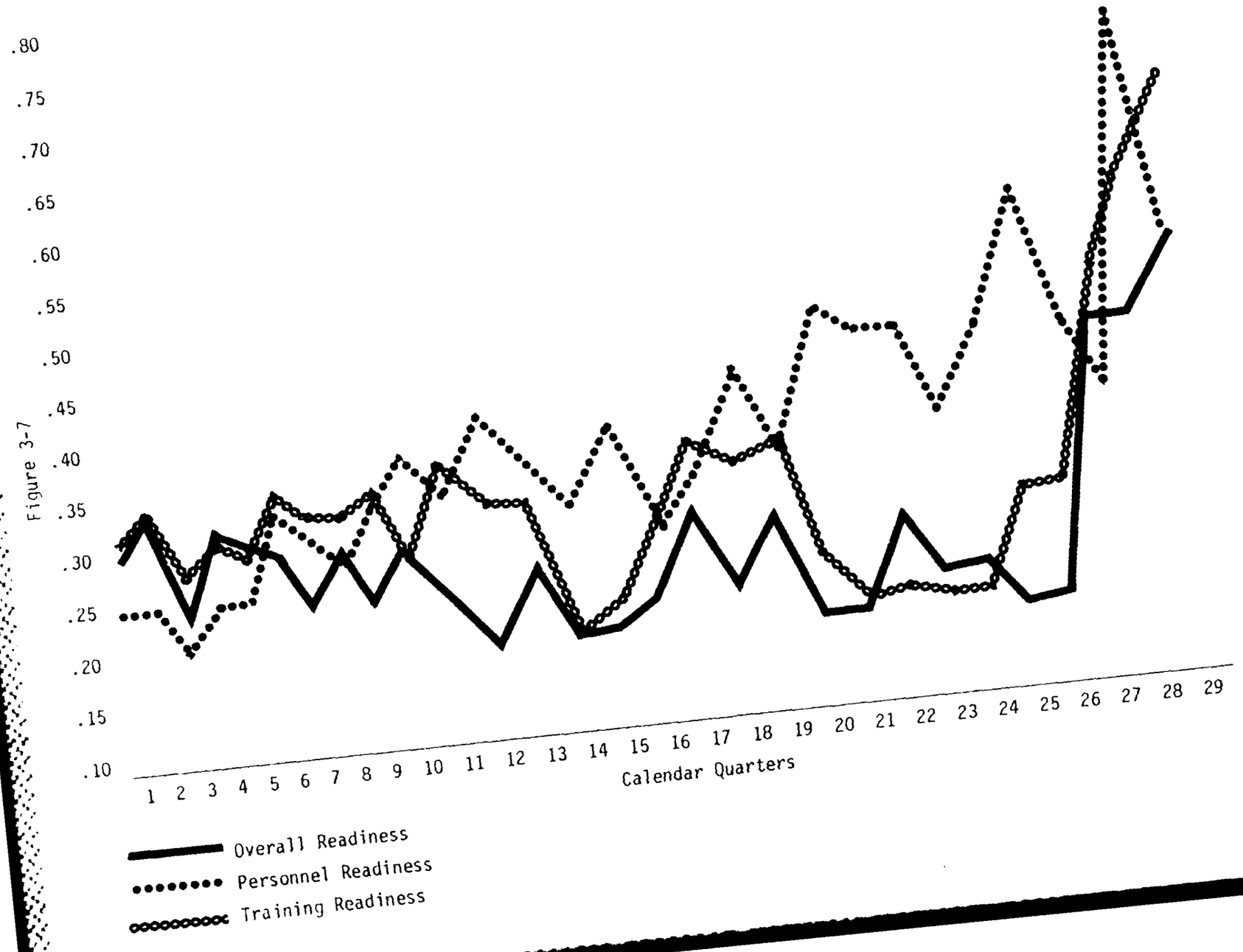

WAVE 1 STANDARD DEVIATIONS AS PREDICTORS
.80
.75
.70
.65
.60
.55
.50
.45
.40
.35
.30
.25
.20
.15
.10
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
Calendar Quarters
Overall Readiness
Personnel Readiness
Training Readiness

Figure 3-7

WAVE 2 STANDARD DEVIATIONS AS PREDICTORS

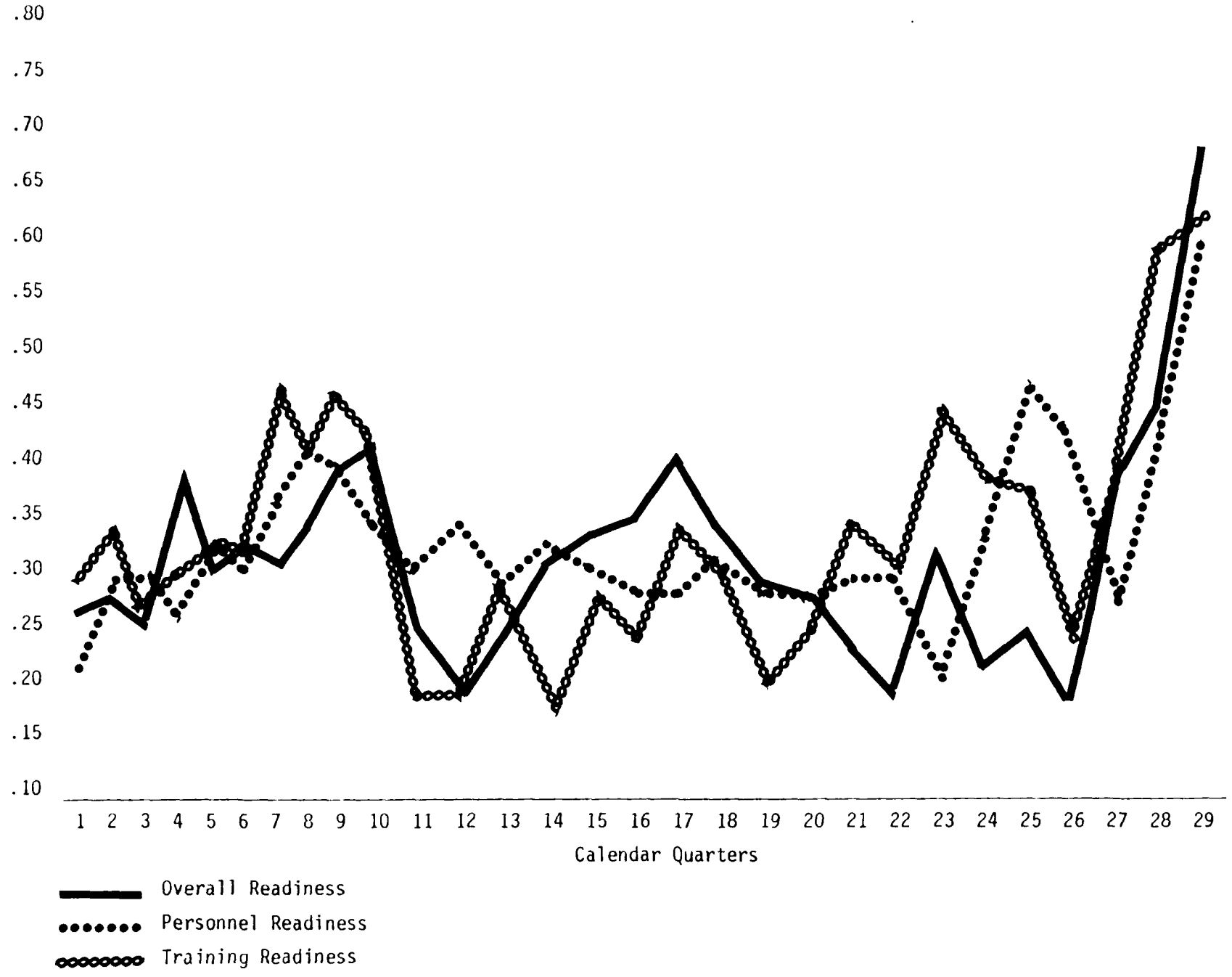


Figure 3-8

Figure 3-6 Wave 2 Climate means predicting Overall, Personnel, and Training Readiness.

Figure 3-7 Wave 1 Culture SD's predicting Overall, Personnel, and Training Readiness.

Figure 3-8 Wave 2 Culture SD's predicting Overall, Personnel, and Training Readiness.

The data indicate the following:

- There are far more statistically significant coefficients for Wave 1 Climate than one would expect by chance, especially for Personnel Readiness.

- For Wave 1 Climate in relation to Personnel Readiness, significant coefficients pile up in quarters 17 - 30, which is four to eight years after the time of the Wave 1 survey.

- Wave 1 Culture measures present generally weaker results for Overall and Training Readiness, but similar results to the Wave 1 Climate measures in relation to Personnel Readiness.

- Wave 2 Climate measures present a pattern similar to that found for Wave 1 Climate measures, but slightly weaker.

- For Wave 2 Culture measures, the general pattern is one which is similar to, but weaker than, that found for Wave 1 Culture measures. One exception occurs for Training Readiness in quarters 7 - 10, where significant coefficients are found. In real time, this would be two to three iyears after Wave 1 and more or less coterminus with Wave 2.

The Twelve-year Subsample. Multiple regression coefficients to these 29 calendar quarters of readiness data, predicting from the earlier wave of NHRMS data, obtained in 1974-76, are

presented in Appendix A. As in the case of reenlistment rates, the pattern obtained is similar to that for Waves 1 and 2, but the reduced number of cases makes statistical significance extremely difficult to attain. As before, it should be noted that the coefficients are quite consistent with the statistically significant ones obtained in the 271-unit Franklin & Drexler (1976) study.

Readiness Over Time. An intercorrelation matrix for Overall Readiness for the 29 quarters is presented in Appendix A. The data indicate that, as in the case of reenlistment rate, rates tend toward considerable stability over time.

As with reenlistment rates, the pattern is one of reasonably consistent performance over a long period of time, in a significant way driven by organizational climate and culture which existed in the units as much as twelve years earlier.

Chapter IV
The Role Played by Velocity

One part of the present research concerned the role played by personnel velocity, conceptualized as the number of bodies pumped through a given unit in a given period of time. The overall concept was that climate- and culture-driven performance led to different levels of attrition, through reenlistment rates, unauthorized absences, desertions, and non-judicial punishment, and that these in turn led to higher personnel velocity. In turn, this was thought likely to be associated with Upgrade rates, since a higher number of persons vulnerable psychologically to that situation would be pumped through a given unit whose practices were worse. As the earlier description of measures and methods indicated, for the purposes of this project a special, independent measure of velocity was created which consisted of the number of separate individuals present in a given unit in each of two three-year periods (1980-82, and 1983-85). Each was divided then by the average complement for any one year in that period for ships of that type, and the two numbers averaged to get an Overall Velocity measure for the six-year period.

The Propositions to be Tested

Three propositions concerning velocity were listed in the proposal as among those to be tested:

> ***Personnel velocity results from the replacement of losses incurred as a result of low reenlistment rates, reenlistment for reassignment, unauthorized absence, non-judicial punishment, and the like, which are***

themselves the result of organizational practices and conditions.

Units with high velocity, but which have for some reason experienced a positive interruption of the climate-culture transmission, will have lower Upgrade rates than similar high velocity units whose negative practices have been transmitted, but higher Upgrade rates than low velocity units.

Unit performance will be impacted by the joint effects of transmitted practices and conditions and personnel velocity.

In the remainder of this chapter, each of these will be addressed in turn, followed by additional information concerning velocity, plus conclusions about the role which it plays.

Culture, Climate, Performance, and Velocity

The first of the three propositions stated that we would expect to find relationships among performance, culture/climate, and velocity, such that (a) poor culture and climate practices lead to (b) poor personnel performance, which leads to (c) higher velocity. The three sets of measures should, in other words, at the outset be interrelated. Table 4-1 presents correlations of the three waves of Climate and Culture super-indexes with Velocity. As is apparent, Velocity appears to be unrelated to Climate and Culture.

Table 4-2 presents correlations of performance measures by period, both for measures present only in the previous study, and for the augmented reenlistment and readiness measures used in the present study. The data show the following:

- Correlation coefficients to Unauthorized Absences, Desertions, and Drug & Marijuana Offenses are not

RELATIONSHIP OF VELOCITY TO PERFORMANCE

Overall Performance Measures

Periods	Total Reenlistment	Overall Readiness	Personnel Readiness	Training Readiness	Non-Judicial Punishment	Drug & Marijuana Offenses	Unexcused Absences	Desertion
1	-0-	-0-	-0-	-0-	-.80	.34	.83	-0-
2	.73	.96	.84	.46	-.53	.47	-.42	-.52
3	-.25	.37	.10	.18	-.66	-.19	.03	-.22
4	.53	-.48	-.20	-.29	-.33	-.19	-.11	-.36
5	.20	-.39	.01	-.10	-.07	.16	.02	-.19
6	-.06	-.16	.25	-.12	.01	-.01	.02	-.20
7	.08	-.28*	-.06	-.17	.13	.18	-.09	-.10
8	.15	-.10	-.01	.01	.11	.15	-.08	-.21
9	-.18	-.21*	-.05	-.27*	.11	.21	.09	.02
10	.07	-.39*	-.10	-.36*	.09	.03	.12	.12
11	.13	-.40*	-.15	-.40*	.22	.10		
12	.16*	-.41*	-.13	-.39*	.26*	.29*		
13	.19*	-.17*	-.06	-.20*	.35*	.01		
14	.28*	-.21*	-.10	-.17*	.24*	.05		
15	.24*	-.07	-.10	-.01	.14	.01		
16	.22*	-.12	-.02	-.04	.32*	.17		
17	.20*	-.09	.05	-.10	.06	.02		
18	.14	-.14	.02	-.08	.09			
19	.15	-.09	.06	-.11	.27			
20	.21	-.11	.05	-.16	.35			
21	.28*	-.15	-.01	-.16	.26			
22	.22*	-.11	-.04	-.10	.67			

Table 4-2

Overall Performance Measures

Periods	Total Reenlistment	Overall Readiness	Personnel Readiness	Training Readiness	Non-Judicial Punishment	Drug & Marijuana Offenses	Unexcused Absences	Desertion
23	.16	-.03	.02	-.03				
24	.09	-.11	-.04	-.10				
25	.11	-.04	-.03	-.19*				
26	.10	-.11	-.01	-.18*				
27	.21	-.15	-.04	-.22*				
28	.15*	-.01	.04	-.17				
29	.17*	.06	.06	-.17				
30	.31*	.01	.04	-.19*				
31	.30*	.16*	.14	-.06				
32	.31*	.11	.16	-.09				
33	.38*	.06	.08	-.02				
34	.32*	.19*	.17	.05				
35	.22*	.03	.04	-.08				
36	.16*	.06	.08	-.07				
37	.25*	.07	.21	-.01				
38	.14	.07	.12	-.08				
39	.20*	-.06	.07	-.12				
40	.21	-.04	.11	-.14				
41		-.07	.09	-.18				
42		-.03	.09	-.13				
43		.05	-.03	-.14				
44		.08	-.20	-.01				
45		-.22	-.24	-.26*				
46		.08	.06	-.20				
47		-.04	.06	-.23				

Note: Horizontal line indicates end of performance periods prior to Wave 1.

* Significant at or beyond the five percent level of confidence.

calculated and in which, it was hypothesized, effects should be seen.

- Non-Judicial Punishment Rate shows significant, negative coefficients in the period roughly contemporary to the early velocity years. The higher the Non-Judicial Punishment Rate, the higher the velocity. This finding tends to support the hypothesis.

- Total Reenlistment shows a pattern of coefficients that are significant and positive from Wave 1 on, in other words more or less contemporary to the Velocity measure period. However, the direction is precisely the reverse of what was hypothesized: the higher the reenlistment rate, the higher the Velocity.

- Readiness was not included among the measures hypothesized as relating; nevertheless results are presented for these measures as well. They show significant negative coefficients for the periods just preceding the Velocity period, largely because of a similar pattern found for Training Readiness. The worse overall readiness had been, the lower was subsequent Velocity.

These findings cast serious doubt upon the hypothesized role played by Velocity. Only the relationships to Non-Judicial Punishment Rate appear as they were hypothesized to be. The relationships to Readiness and Reenlistment, while real and clearly systematic, seem peculiar. Whatever Velocity represents -- and it clearly represents something it does not seem to be part of the connection over time between Climate and Culture on the one hand and performance on the other.

Velocity, Climate Change, and Upgrade Rate.

The second proposition listed above stated that units with high velocity, but which have for some reason experienced a

positive interruption of the climate-culture transmission, will have lower Upgrade rates than similar high velocity units whose practices have deteriorated over time, but higher Upgrade rates than low velocity units.

We know from our previous work evaluating Project Upgrade (See the technical reports for Contract N00014-81-K-0597) that the higher the percentage of Upgrade candidates, the poorer the functioning of the human organization as measured by the HRMS indexes. Climate, supervision, and peer relationships all correlated strongly, and in a negative direction, with the Upgrade rates of both the first two years of the program. Furthermore, Upgrade percentages were also related to the changes that occured in the functioning of the units in previous years. The more a unit's management, and therefore HRMS scores, improved, the lower the subsequent Upgrade percentages. The characteristics of a units' profile of change between the two waves of survey data were also implicated in moderating the prediction of Upgrade rates, but not in a systematic way. Still, it was clearly a factor in the puzzle and worth some further exploration to determine whether the addition of the velocity variable would increase our ability to predict Upgrade percentages.

To test this hypothesis, a six-celled matrix was constructed dividing the units into the following categories:

1-Units with high personnel velocity that previously had experienced improvement in unit functioning (30 groups)

2-Units with high personnel velocity that had previously experienced deterioration in unit functioning (7 groups)

3-Units with high personnel velocity with mixed change effects (10 groups)

4-Units with low personnel velocity with improvement in unit functioning (37 groups)

5-Units with low personnel velocity with deterioration
(19 groups)

6-Units with low personnel velocity with mixed change effects
(5 groups)

Change profiles were determined through the use of a hierarchical cluster analysis program, HGROUP (Veldman, 1967), a process described in some detail in Bowers, "Organizational Management Performance and Project Upgrade Rates in Navy Units: Report of First Findings," 1983. Personnel velocity was simply split in half so that both the vectors of low and high velocity each held the same number of units.

Analyses of variance with Upgrade percentages separately for each of the first two years of the program and for the two years combined were run against each of the six cells described above. The data are presented in Appendix B. The results indicate that upgrade rates cannot be explained using velocity and change effects and that no significant relationship exists between these measures. Once more, therefore, the Velocity measure fails to function as hypothesized.

Joint Effects of Culture/Climate and Velocity

The third and last proposition stated above stated that prediction of performance should be enhanced by combining Velocity as a predictor those used in the preceding section to predict reenlistment rate and readiness. The data, once more, are contained in Appendix A, where coefficients for identical periods, using Velocity and not using Velocity, are compared side by side. The results indicate that prediction is generally improved, but by a questionable margin that probably simply reflects adding another predictor, even though innocuous.

Conclusions About the Role Played by Velocity

The Velocity portion of the Constancy-Velocity Hypothesis must clearly be rejected. The Velocity measure appears to be quite content valid. Its basic characteristics seem respectable enough:

- Mean Velocity = 1.91
- Minimum Velocity Score = 1.66
- Maximum Velocity Score = 2.91
- Standard Deviation = .15

The measure is, obviously, rather skewed in its distribution. The unit with the lowest velocity is pumping only one-eighth fewer people through the system in the three-year period, whereas the unit with the highest velocity is pumping 52 per cent more through in that same period.

Furthermore, that it relates to those performance measures that it does, at levels and with frequencies that are beyond being chance occurrences, indicates that it is real enough. It is simply unrelated to the long-term effects being examined in this research effort.

Chapter V
The Role Played by Critical Events

The research proposal hypothesized that certain critical events might substantially impact organizational climate and practices, organizational culture, and performance, and perhaps the relationships of these to one another. The proposition was stated as follows:

> Velocity events, such as changes of command, deployments, and general or special changes in policy may impact organizational practices, the resulting climate and culture, or personnel velocity directly, thereby altering downstream consequences.

As was indicated in Chapter II, three such critical events were selected and coded from ship and aviation unit histories. Change of Command was coded as number of months since change of command at the time of the survey wave. Deployment was coded in two ways: (a) months since deployment at the time of the survey wave, and (b) months deployed since the last survey wave, both of these as of the time of the survey wave. Overhaul was similarly coded for ships only, as (a)months since overhaul, and (b) months in overhaul since last survey, once more as of the time of the survey wave in question. The rationale for coding in this fashion was that, if the event had an impact, the length of time exposed to it, or the length of time since exposure to it should affect the organizational or performance data.

Although critical events data were collected for the entire period 1974 - 1985, only two sets were used: those corresponding in time to survey Waves 1 and 2. The first analysis consisted of zero-order correlations between critical events predictors, on the one hand, and climate, culture, and velocity measures on the other. The

coefficients themselves are presented in Appendix C. Those to Wave 1 Critical Events present a pattern that appears to be largely one of random effects. Eight per cent are significant at the five per cent level of confidence, and even those that attain significance seem not very consistent.

Those to Wave 2 Critical Events seem a bit more substantial, but only a bit.

- The longer the number of months since deployment at survey Wave 2:
    * the higher the supervisory leadership means at Wave 1.
    * the higher the peer relationship means at Wave 2.
    * the tighter the peer relationship consensus (culture) at Wave 2.
- The greater the number of months deployed since the last survey:
    * the tighter the peer relationship consensus at Wave 2.
- The higher the supervisory leadership and peer relationship means were at Wave 1, and the tighter the consensus (culture) was on organizational climate, supervisory leadership, and peer relationships at Wave 1:
    * the longer the number of months since overhaul at Wave 2.
- The higher the supervisory leadership and peer relationship means were at Wave -1 (the earlier survey wave, in 1974 - 1976):
    * the longer the time spent in overhaul at the time of Wave 2.

- No significant relationships were obtained to Velocity.

Whatever the meaning of these coefficients may be, they seem as likely to indicate impact of organizational climate and culture upon critical events as impact of critical events upon organizational climate and culture. Since the former explanation seems unreasonable (overhaul or deployment dates are scarcely determined by a unit's climate and culture), it seems more likely that they are minor, coincidental effects of schedules.

In the possibility that critical events worked in combination and were non-linear, they were combined as predictors in a multiple classification analysis, predicting climate, culture, and velocity measures. The data, too voluminous to be presented here, showed very little. Prediction was not improved, and, as with the zero-order correlations, almost everything was non-significant.

As for Climate and Culture, Critical Events data were also correlated to Overall Readiness and Total Reenlistment. The zero-order coefficients, presented in Appendix C, are similar to those to Climate and Culture. Relatively few are statistically significant, certainly not enough to permit a pattern of any real meaning to emerge. Again as with Climate and Culture, combined prediction and non-linearity were tested against Readiness data, and, as before, prediction was not enhanced, nor did any noticeable number of coefficients attain significance.

Our conclusion from these analyses is that the Critical Events -- Changes of Command, Deployment, and Overhaul -- have little or no relationship to climate and culture, nor to reenlistment rate or readiness over time. Perhaps this is, after all, not too surprising, considering the constancy which the other analyses in this study have revealed. Climate and Culture, and their impacts upon performance, seem

to be long-term matters, whereas critical events such as these are discrete, or at most temporary, matters.

Chapter VI
The Interrelationship Between Climate and Culture Measures

The results presented in Chapter Three showed that climate and culture measures appeared to be *substitutes* with respect to the prediction of performance. That is, each of these two measures, taken alone, correlated well with the dependent variables reenlistment (.45) and readiness (.30), and adding the second variable to the regression equation did little to increase the predictive power. Thus, the mean scores and variance scores on the survey indexes predicted the same variance in the dependent measures. This presents somewhat of a surprise because mean and variance scores are usually unrelated, and would be expected not to overlap as predictors.

The findings in Chapter Three imply that there must be a close relationship between the mean and variance scores for each of the domain indexes, and raises an interesting set of questions: what is the relationship between a "good" climate and a "strong" culture, (defined as the mean and variance scores) and how does that evolve over time? This chapter examines these questions by looking systematically at the interrelationships between the the survey indexes both within wave and across wave.

The analyses described in this chapter took the domain indexes for climate, supervisory leadership, and group process and computed mean and variance scores for all units in waves one and two in the eight-year data set and for waves one, two, and three in the twelve-year data set. Correlations were then computed within wave and between wave for both data sets on all of the domain indexes. The actual correlation matrices for the two and three wave data sets are presented in Table 6.1 and 6.2. This chapter addresses a

Table 6.1. Two-Wave Correlation Matrix

		Wave 1 Mean Scores			Wave 1 Variance Scores			Wave 2 Mean Scores			Wave 2 Variance Scores	
		Climate	Leader	Group	Climate	Leader	Group	Climate	Leader	Group	Climate	Leader
Wave 1 Mean Scores	Climate											
	Leadership	.7847 (141)										
	Group	.7415 (141)	.8904 (141)									
Wave 1 Variance Scores	Climate	.0145 (141)	.0734 (141)	-.0373 (141)								
	Leadership	-.4774 (141)	-.5422 (141)	-.4561 (141)	.4001 (172)							
	Group	-.3768 (141)	-.3961 (141)	-.4535 (141)	.5713 (172)	.7350 (172)						
Wave 2 Mean Scores	Climate	.6913 (139)	.6362 (139)	.5862 (139)	-.0138 (170)	-.4650 (170)	-.3539 (170)					
	Leadership	.6575 (139)	.7536 (139)	.6942 (139)	.0085 (170)	-.4414 (170)	-.3885 (170)	.7741 (171)				
	Group	.6677 (139)	.7322 (139)	.7511 (139)	-.0030 (170)	-.4683 (170)	-.4231 (170)	.7738 (171)	.8881 (171)			
Wave 2 Variance Scores	Climate	.1051 (140)	.2283 (140)	.1446 (140)	.5489 (140)	.1747 (140)	.1807 (140)	.0364 (140)	.1264 (140)	.0742 (140)		
	Leadership	-.3179 (140)	-.2655 (140)	-.2938 (140)	.1929 (140)	.3458 (140)	.2219 (140)	-.4495 (140)	-.4425 (140)	-.3092 (140)	.3302 (141)	
	Group	-.2065 (140)	-.2228 (140)	-.3160 (140)	.2104 (140)	.3641 (140)	.3402 (140)	-.3595 (140)	-.3656 (140)	-.4517 (140)	.4278 (141)	.5955 (141)

Table 6.2. Three Wave Correlation Matrix

		Wave 1 Mean Scores			Wave 1 Variance Scores			Wave 2 Mean Scores			Wave 2 Variance Scores			Wave -1 Mean Scores			Wave -1 Variance Scores	
		Climate	Leadership	Group	Climate	Leadership	Group	Climate	Leadership	Group	Climate	Leadership	Group	Climate	Leadership	Group	Climate	Leadership
Wave 1 Mean Scores	Climate	0.5275 (53)	0.5124 (43)	0.5052 (42)	0.1035 (51)	0.4021 (51)	0.2218 (51)	0.4585 (54)	0.4868 (54)	0.4484 (54)	0.2076 (43)	-0.3159 (43)	0.3879 (43)					
	Leadership	0.5763 (36)	0.6010 (36)	0.6260 (36)	0.1285 (46)	0.5356 (46)	0.2859 (46)	0.4766 (46)	0.5761 (46)	0.5093 (46)	0.1209 (36)	0.3671 (36)	-0.4022 (36)	0.1707 (46)				
	Group	0.5001 (42)	0.5582 (42)	0.6239 (40)	0.1151 (50)	0.5115 (51)	0.3418 (51)	0.5151 (54)	0.6098 (54)	0.6120 (54)	0.3267 (43)	-0.3001 (43)	0.5333 (43)	0.7762 (54)	0.0653 (46)			
Wave 1 Variance Scores	Climate	0.1216 (42)	0.1062 (42)	0.0901 (42)	0.1661 (51)	0.0339 (51)	0.0780 (51)	0.0485 (54)	0.0882 (54)	0.0448 (54)	0.4683 (43)	0.0817 (43)	0.3585 (43)	0.2156 (54)	0.3557 (46)	0.0167 (54)		
	Leadership	0.2551 (36)	0.2792 (36)	0.3630 (36)	0.1019 (46)	0.2049 (46)	0.2702 (46)	0.1468 (46)	0.3219 (46)	0.3524 (46)	0.2255 (36)	0.0614 (36)	0.3004 (36)	0.4784 (46)	0.5115 (46)	0.4260 (46)	0.1971 (46)	
	Group	0.2041 (42)	0.2557 (42)	0.3654 (42)	0.0804 (51)	0.1449 (51)	0.3483 (51)	0.2014 (54)	0.3958 (54)	0.5071 (54)	0.5703 (43)	0.2780 (43)	0.6312 (43)	0.4545 (54)	0.4740 (46)	0.5606 (54)	0.5696 (54)	0.6892 (46)
		Climate	Leadership	Group	Climate	Leadership	Group	Climate	Leadership	Group	Climate	Leadership	Group	Climate	Leadership	Group	Climate	Leadership
		Wave 1 Mean Scores			Wave 1 Variance Scores			Wave 2 Mean Scores			Wave 2 Variance Scores			Wave -1 Mean Scores			Wave -1 Variance Scores	

series of questions using the logic of cross-lag panel correlation, drawing on the correlations presented in the matrices.

Findings

The findings are presented in the following order: The stability of each of the measures over time; the relationship between the mean and variance scores for each of the domain indexes; relationships within wave for mean and variance scores across domains; and finally, cross-wave relationships both within domain and between domains. A brief discussion at the end of this chapter summarizes the results and their implications for the future study of climate, culture, and performance.

Stability of the Measures Over Time

An analysis of the stability of the measures over time revealed that mean scores are highly stable, with the correlation between T1 and T2 measures varying from .69 to .75 across the three domains. Variance scores were substantially less stable, with the correlation between T1 and T2 climate variance scores being .54, while the correlation between T1 and T2 variance scores for leadership and group processes was .34. This indicates that the consistency of leadership and group processes is far more likely to change over time in a unit than is the overall level of climate, leadership or group processes.

Correlations between Mean and Variance Scores

The correlations between mean and variance scores within wave and within domain show an interesting pattern. The correlation between the mean and variance scores on the climate index is essentially zero for both waves. In contrast, the correlation for mean and variance scores for

supervisory leadership and group process domains is quite strongly negative, ranging from -.44 to -.54. This finding implies that "good" leadership is consistent leadership, and that "good" group processes are consistent group processes. A "good" climate, however, is not necessarily a consistent climate, or a "strong" culture.

Within Wave Relationships

An analysis of relationships within wave, but between domains shows that the domains are closely related, and that leadership and group process measures are more closely related than are climate and leadership, or climate and group process measures. This pattern, presented below in Figure 6.1 holds true for both mean and variance measures. The correlations for wave 2 are presented in parentheses. Thus, variance in one domain is a reasonably good predictor of variance in other domains.

The second question to be addressed via the within wave results concerns the use of variance scores within one domain to predict mean scores within another domain. This analysis, although there is no time lag involved, applied the cross-lag logic in an effort to focus on assymetric relationships between domains. The analysis followed the logic presented by Franklin (1975) which argued that "upstream" domains should have a greater impact on "downstream" domains in the climate -- leadership -- group processes sequence. This results showed little assymetry between the leadership and group process domains, but substantial assymetry between the climate and leadership domains. The climate and leadership analysis is presented below in Figure 6.2. Correlations for wave two are presented in parentheses.

This finding is a unique one, suggesting that a favorable climate within a unit is closely associated with a consistent pattern of leadership. In contrast, favorable leadership has

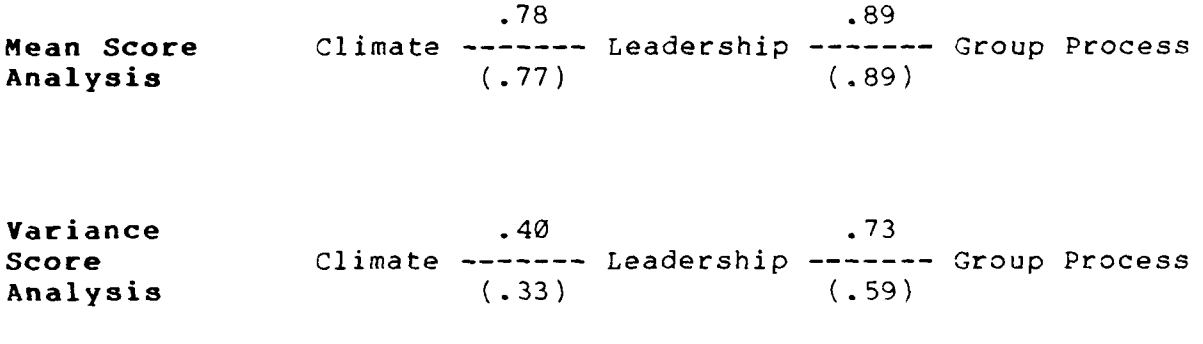


Figure 6.1.

Correlations of Mean and Variance Scores Within Wave

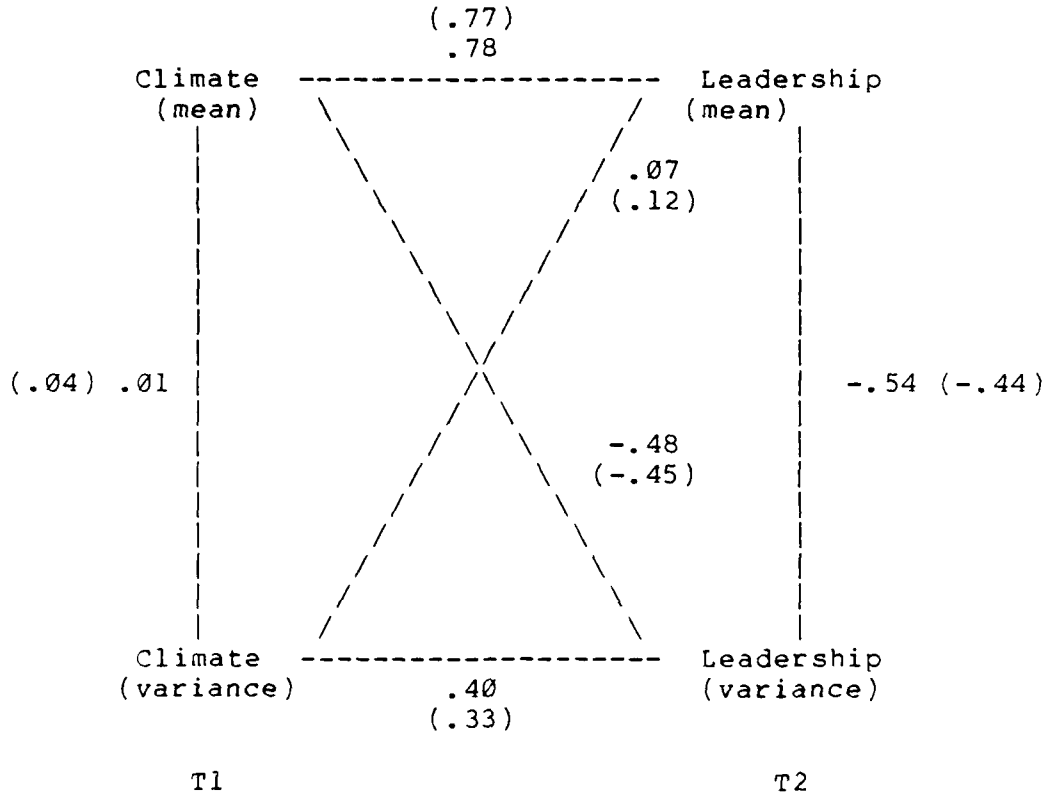


Figure 6.2.

Cross-correlational analysis of climate and leadership measures.

little to do with a consistent climate. This finding implies that one of the main benefits of a good climate is the capacity it creates to develop a common leadership style and consistent set of norms regarding how groups work together. Even though these findings are cross-sectional, they still seem to suggest a new process by which a favorable climate has an impact on unit performance and effectiveness.

Cross-Wave Relationships

The next set of analyses were a set of conventional cross-lagged comparisons of the impact both within and between domains over time. There are four sections: 1) The first set of comparisons examined questions such as; does T1 climate "cause" T2 climate? Does T1 leadership variance explain T2 leadership variance? 2) The second set of analyses examined scores across domain over time, and asked questions such as do T1 climate means predict T2 leadership or group means? Does T1 leadership variance predict T2 group process variance? 3) The third set of analyses combined mean and variance scores and addressed questions such as does T1 climate variance influence T2 leadership means? 4) Do these same patterns appear when the time lag is extended, and the relationships are examined in the context of the three wave, twelve-year sample? The results of these analyses are summarized below.

1. Within-domain, cross-wave, treating mean and variance separately.

These results showed a high level of association among the variables, similar to that described under "Stability of the Measures Over Time." There was, however, little directionality. Using mean scores first, and then variance scores, there was little evidence that mean scores at T1 "caused" mean scores at T2, or that variance scores at T1 caused variance scores at T2. This finding is some contrary

to earlier research that has shown "downstream" influence among index means over time (Franklin, 1975).

2. Cross-domain, cross-wave, treating mean and variance separately.

In a similar fashion, these analyses showed a high level of intercorrelation over time among mean scores, but little directionality. Variance scores showed a moderate level of intercorrelation over time, but also showed little directionality.

3. Cross-domain, cross-wave, combining mean and variance scores.

These analyses show a pattern that is very similar to that presented above in Figure 6.2. Climate mean scores at T1 prove to be good predictors of the variance in leadership at T2. Climate variance scores at T1, however, are not good predictors of supervisory leadership measures at T2. This same pattern occurred when climate scores were compared to group process scores, but did not appear when leadership scores were compared to group process scores. The results for the climate - leadership analysis are presented below in Figure 6.3.

This analysis does present convincing evidence that a favorable climate is one which, over time, reduces the variance in leadership and group processes. This idea offers a new set of hypotheses that may be used in the future to examine the process by which a favorable organizational climate influences performance and effectiveness over time.

4. Cross-domain, three-wave, combining mean and variance scores.

The final set of analyses presented here use the three-wave data set to determine if the findings from the two-wave data

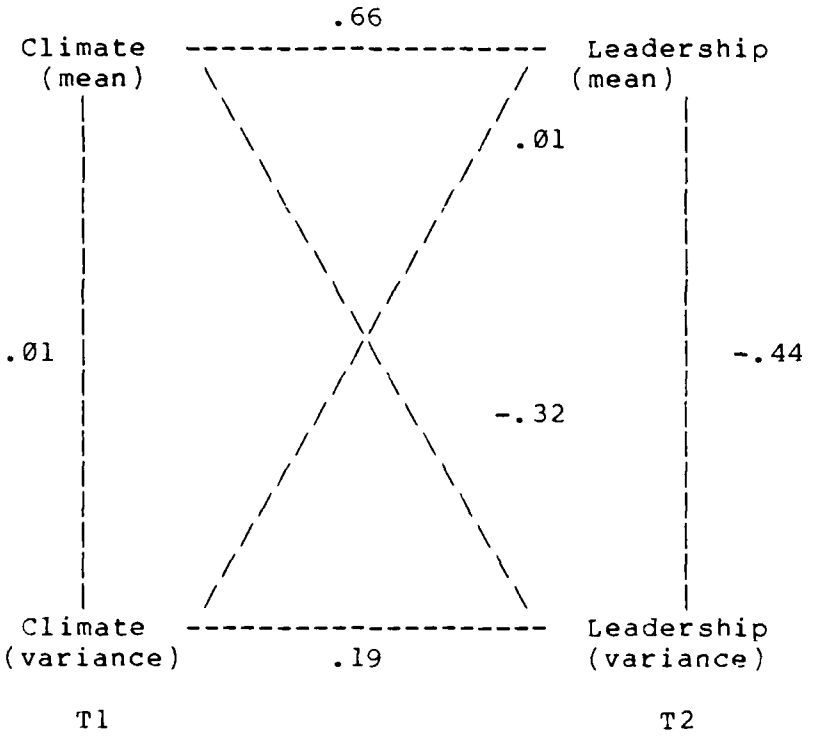


Figure 6.3.

Cross-lagged analysis of climate and leadership measures.

set hold up when they are extended over the longer time period. In general, the analyses reveal that the findings do hold up over the longer time period, and reinforce the idea that one of the clearest effects of a favorable climate is to reduce the amount of variance in leadership practices and group processes. The results for the cross-lagged analyses of climate and leadership measures is presented below.

Although these results generally support the findings from the larger two-wave data set, one anomaly appears -- the correlation between T1 climate variance and T2 leadership variance is *negative* (-.30). This suggests that high variation in climate, and a favorable climate are the condition which, in combination, is most likely to produce consistent leadership practices.

Discussion

This examination of the interrelationships among the domain indexes in this study has helped to explain some of the dynamics between climate and culture, and also helped to explain the finding in Chapter Three that mean and variance scores on the domain indexes seemed to be substitutes with respect to predicting the variance in the dependent measures of reenlistment and readiness.

The findings showed that mean and variance scores are closely related for leadership and group process indexes, suggesting that favorable conditions in these domains are also likely to be consistent conditions. This was not the case with climate measures, however, since mean and variance scores were essentially uncorrelated. These findings suggest that the overlap between mean and variance scores as predictors of performance can be attributed to the high correlation between mean and variance scores for leadership and group process measures.

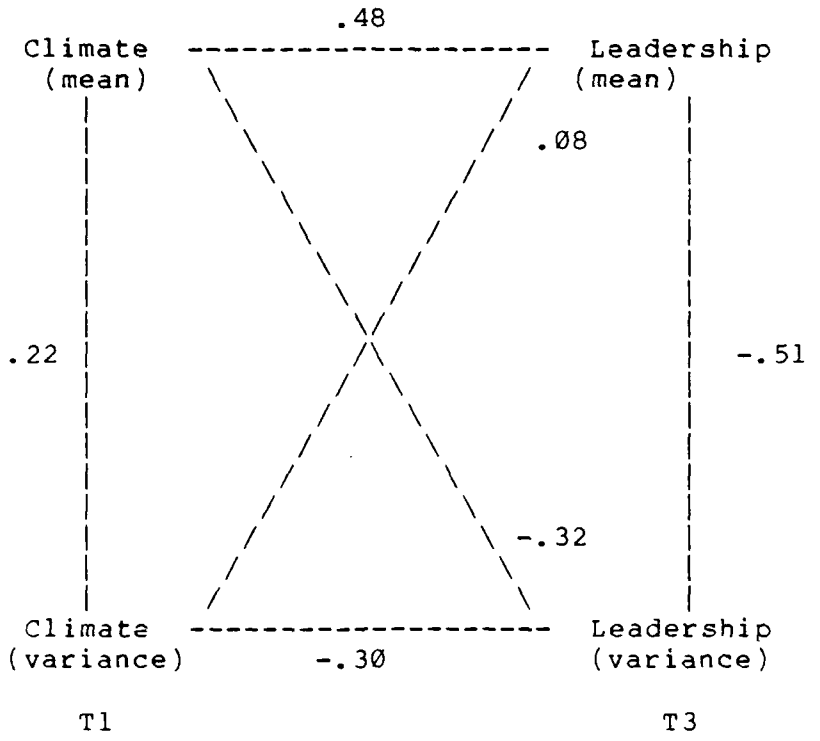


Figure 6.4.

Cross-lagged analysis of climate and leadership measures in waves one and three.

Cross-lagged analysis failed to find strong predictive relationship using mean scores to predict mean scores, or variance scores to predict variance scores. However, combining mean and variance scores showed that a favorable climate seems to create consistent leadership and group processes over time.

This finding is a unique one in the literature, and requires a new way of looking at the process by which a favorable climate impacts unit performance and effectiveness. This finding also suggests that future research should examine more closely the sequential effects of a strong culture and a favorable climate on leadership, group processes, performance, and effectiveness.

Bibliography

Bowers, D.G. The purpose and functioning of ICLS. Institute of Internal Auditors, 1968.

Bowers, D.G. Organizational management performance, and Project Upgrade rates in Navy units. Technical Report to the Office of Naval Research, May, 1983.

Bowers, D.G., and Krauz, L.S. Organizational correlates of Project Upgrade. Technical Report to the Office of Naval Research, August, 1983.

Bowers, D.G., Krauz, L.S., and Denison, D.R. Cases of Project Upgrade: results of interview studies in 14 fleet units. Technical Report to the Office of Naval Research, August, 1983.

Bowers, D.G., and Ross, G.H.B. A model of inter-organizational influences on organizational processes - Report I. Institute for Social Research, August, 1979.

Brumfield, A.H., and Crockett, W.H. Employee attitudes and employee performance. Psychology Bulletin, 1955, 52, 396-424.

Cameron, K. Measuring organizational effectiveness in institutions of higher education. Administrative Science Quarterly, 1978, 23. 606-632.

Cameron, K. Effectiveness as paradox: Consensus and conflict in conceptions of organizational effectiveness, 1986, 32, 539-553.

Cameron, K, and Whetten, D. Organizational effectiveness: A comparison of multiple models. New York: Academic Press, 1983

Denison, D. The climate, culture and effectiveness of work organizations: A study of organizational behavior and financial performance. Unpublished doctoral dissertation, University of Michigan, 1982

Denison, D. A summary of survey and performance results for 1985 and 1986: Honeywell Aerospace and Defense. Research report, University of Michigan, 1987

Denison, D. Corporate culture and organizational effectiveness. New York: John Wiley and Sons, forthcoming.

Denison, D., and Bowers, D.G. Forecasting unit performance: a current value human resources accounting system for

Navy organizations. Technical Report to the Office of Naval Research, August, 1983.

Drexler, J.A., and Franklin, J.L. Relations between social psychological factors and performance criterion measures in multi-organization research: by methodological issues. Technical Report, Naval Personnel Research and Development Center, July, 1976.

Franklin, J.L., and Drexler, J.A. Influences of conditions and practices on personnel retention and organizational performance. Technical Report, Naval Personnel Research and Development Center, November, 1976.

Georgopoulos, B. Organizational structure, problem solving, and effectiveness. San Francisco, CA.: 1987.

Glick, W. Response: Organizations are not central tendencies: Shadowboxing in the dark, Round 2. Academy of Management Review, 1988, 13, 133-137.

Glisson, C. and Martin, P. Productivity and efficiency in human service organizations as related to structure, size, and age. Academy of Management Journal, 1980, 23, 21-37.

Goodman, P., Atkin, R., and Schoorman, D. On the demise of organizational effectiveness studies. in K. Cameron and D. Whetten, Organizational effectiveness: A comparison of multiple models. New York: Academic Press, 1979

Guion, R. A note on organizational climate, Organizational Behavior and Human Performance, 1973, 9, 120-125.

Hansen, G.S., and Wernerfelt, B. Determinants of firm performance: The relative importance of economic and organizational factors. Unpublished paper, University of Washington, March, 1987.

Herzberg, F., Mausner, B., Peterson, R.O., and Capwell, Dora F. Job attitudes: review of research and opinion. Pittsburgh: Psychological Services of Pittsburgh, 1957.

James, L., and Jones, A. Organizational climate: A review of theory and research, Psychological Bulletin, 1974, 81, 1096-1112.

James, L., Joyce, W., and Slocum, J. Comment: Organizations do not cognize. Academy of Management Review, 1988, 13, 129-132.

Kanter, R. The change masters. New York: Simon and Schuster, 1983.

Khandwalla, P. Viable and effective organizational designs of firms. Academy of Management Journal, 1973, 16, 481-495.

Lawrence, P. and Lorsch, J. Organization and environment. Cambridge, MA.: Harvard Business School, 1967.

Likert, R. New patterns of management. New York: McGraw-Hill Book Co., Inc., 1961.

Likert, R. The human organization. New York: McGraw-Hill Book Co., Inc., 1967.

Likert, R., and Seashore, S. Making cost control work. Harvard Business Review, 1963, 41(6), 96-108.

Martin, J. Stories and scripts in organizational settings, in A. Hastorf and A. Isen (Eds.) Cognitive social psychology. New York: Elsevier, 1982.

Miller, D.C., and Form, W.H. Industrial society: the sociology of work organizations, (2nd edition). New York: Harper & Row, 1964.

Payne, R., and Pugh, D. Organizational structure and climate. in M. Dunnette (Ed.) Handbook of Industrial and Organizational Psychology. Chicago, IL.: Rand McNally, 1976.

Pecorella, P.A., Bowers, D.G., Davenport, A.S., and Lapointe, J.B. Forecasting performance in organizations: an application of current-value human resources accounting. Technical Report to the Office of Naval Research, August, 1978.

Peters, T. Thriving on chaos. New York: Knopf, 1987.

Peters, T., and Waterman, R. In search of excellence. New York: Harper and Row, 1982.

Seashore, S. Group cohesiveness in the industrial work group. Ann Arbor, MI.: Institute for Social Research, 1954.

Seashore, S., and Yuchtman, E. Factorial analysis of organizational performance. Administrative Science Quarterly, 1967, 10, 377-395.

Taguiri, R., and Litwin, G. Organizational climate: Explorations of a concept. Boston, MA.: Harvard University Press, 1968;

Veldman, D.J. Fortran programming for the behavioral sciences. New York: Holt, Reinhart, & Winston, 1967.

Wilkins, A., and Ouchi, W. Efficient cultures: Exploring the relationship between culture and organizational performance, Administrative Science Quarterly, 28(3), 468-481, 1983.

Woodman, R., and King, D. Organization climate: Science or folklore? Academy of Management Review, 1978, 816-826.

APPENDIX A

DATA SUPPORTING CHAPTER III

APPENDIX A-1

Multiple R's to Reenlistment

MULTIPLE R's
WAVE 1 MEANS TO TOTAL REENLISTMENT

Total Reenlistment By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.36*	.40*
2	.48	.52
3	.53	.58
4	.49	.51
5	.54	.58
6	.50	.57
7	.51	.56
8	.49	.53
9	.49	.50
10	.48	.51
11	.49	.55
12	.45	.53
13	.46	.52
14	.41	.46
15	.52	.51
16	.48	.52
17	.56	.58
18	.56	.57
19	.51	.53
20	.39	.42
21	.45	.54
22	.39	.48
23	.45	.53
24	.37	.50
25	.42	.52
26	.51	.56
27	.45	.48
28	.54	.56
29	.37*	.38*
30	.54	.55
31	.56*	.59
32	.69*	.71*

*Not significant beyond five percent level of confidence.

MULTIPLE R's
WAVE 1 MEANS TO FIRST-TERM REENLISTMENT

First-Term Reenlistment By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.52	.55
2	.52	.56
3	.57	.59
4	.42	.42
5	.46	.50
6	.43	.50
7	.46	.53
8	.48	.53
9	.53	.55
10	.53	.55
11	.49	.57
12	.50	.58
13	.50	.54
14	.39	.45
15	.46	.48
16	.39	.42
17	.50	.53
18	.53	.56
19	.40	.42
20	.35*	.35*
21	.39	.42
22	.38	.44
23	.50	.54
24	.40	.47
25	.46	.51
26	.43	.45
27	.43	.44
28	.57	.58
29	.49	.49
30	.52	.54
31	.48*	.57*
32	.69*	.73*

*Not significant beyond five percent level of confidence.

MULTIPLE R's
WAVE 2 MEANS TO FIRST-TERM REENLISTMENT

First-Term Reenlistment By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.42	.42*
2	.38	.41
3	.48	.51
4	.35*	.38*
5	.35*	.42
6	.30*	.40
7	.31*	.40
8	.36	.41
9	.36	.36*
10	.40	.42
11	.39	.48
12	.42	.51
13	.36	.41
14	.32*	.36*
15	.32*	.30*
16	.39	.37*
17	.36*	.33*
18	.33*	.36*
19	.33*	.34*
20	.37	.40
21	.39	.42
22	.41	.49
23	.49	.56
24	.43	.55
25	.50	.58
26	.45	.47
27	.43	.44
28	.48	.53
29	.45	.47
30	.54	.57
31	.61	.61
32	.72	.72*

*Not significant beyond five percent level of confidence.

MULTIPLE R's
WAVE 2 MEANS TO TOTAL REENLISTMENT

Total Reenlistment By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.32*	.32*
2	.42	.45
3	.51	.57
4	.49	.46
5	.50	.58
6	.52	.59
7	.48	.54
8	.42	.49
9	.43	.46
10	.45	.49
11	.45	.54
12	.50	.60
13	.51	.56
14	.46	.47
15	.56	.55
16	.58	.60
17	.54	.54
18	.49	.51
19	.53	.55
20	.41	.45
21	.45	.54
22	.46	.56
23	.51	.62
24	.42	.59
25	.48	.60
26	.47	.51
27	.51	.56
28	.51	.60
29	.44	.49
30	.54	.56
31	.67	.69
32	.66*	.67*

*Not significant beyond five percent level of confidence.

MULTIPLE R's
WAVE 1 CULTURE TO FIRST-TERM REENLISTMENT

First-Term Reenlistment By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.46	.48
2	.50	.54
3	.55	.59
4	.39	.39*
5	.44	.48
6	.44	.51
7	.46	.52
8	.48	.53
9	.47	.49
10	.44	.46
11	.49	.56
12	.50	.58
13	.52	.55
14	.40	.46
15	.39	.41
16	.37	.40
17	.48	.52
18	.49	.52
19	.38	.40
20	.38	.38*
21	.42	.46
22	.42	.48
23	.51	.55
24	.41	.49
25	.53	.57
26	.42	.43
27	.44	.44
28	.52	.53
29	.48	.48
30	.59	.60
31	.60	.62
32	.59*	.59*

*Not significant beyond five percent level of confidence.

MULTIPLE R's
WAVE 1 CULTURE TO TOTAL REENLISTMENT

Total Reenlistment By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.29*	.34*
2	.49	.52
3	.50	.57
4	.40	.46
5	.48	.55
6	.49	.55
7	.55	.59
8	.54	.57
9	.46	.47
10	.46	.48
11	.51	.57
12	.49	.59
13	.42	.50
14	.44	.49
15	.47	.54
16	.56	.58
17	.55	.57
18	.55	.59
19	.51	.52
20	.49	.52
21	.47	.58
22	.45	.56
23	.44	.55
24	.34*	.54
25	.49	.60
26	.31*	.40
27	.54	.56
28	.46	.53
29	.31*	.35*
30	.52	.53
31	.65	.66
32	.65*	.66*

*Not significant beyond five percent level of confidence.

MULTIPLE R's
WAVE 2 CULTURE TO FIRST-TERM REENLISTMENT

First-Term Reenlistment By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.49	.52
2	.48	.46
3	.35*	.36*
4	.40	.40*
5	.35*	.38*
6	.30*	.38*
7	.32*	.39
8	.30*	.37*
9	.28*	.29*
10	.25*	.28*
11	.28*	.40
12	.37	.46
13	.36*	.39
14	.37*	.39*
15	.34*	.35*
16	.42	.42
17	.37*	.37*
18	.32*	.37*
19	.37*	.38*
20	.34*	.36*
21	.43	.46
22	.42	.50
23	.56	.60
24	.52	.60
25	.61	.65
26	.52	.52
27	.53	.53
28	.60	.61
29	.51	.51
30	.55	.56
31	.64	.64
32	.75	.75*

*Not significant beyond five percent level of confidence.

MULTIPLE R's
WAVE 2 CULTURE TO TOTAL REENLISTMENT

Total Reenlistment By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.33*	.33*
2	.44	.43
3	.39	.41
4	.51	.44
5	.44	.47
6	.31*	.39
7	.39	.44
8	.37	.42
9	.36	.39
10	.35*	.37*
11	.36*	.42
12	.39	.46
13	.39	.42
14	.39	.40
15	.43	.44
16	.52	.56
17	.44	.47
18	.39	.46
19	.47	.49
20	.38	.43
21	.42	.50
22	.39	.46
23	.49	.55
24	.44	.56
25	.43	.54
26	.39	.43
27	.54	.55
28	.57	.60
29	.49	.50
30	.56	.56
31	.64	.64
32	.76	.76

*Not significant beyond five percent level of confidence.

MULTIPLE R's
WAVE -1 TO FIRST-TERM REENLISTMENT

WAVE -1 MEANS AND STANDARD DEVIATIONS
TO FIRST-TERM REENLISTMENT

First-Term Reenlistment By Calendar Quarter	Means: Climate Predictor To First-Term Reenlistment	Standard Deviations: Culture Predictor To First-Term Reenlistment
1	.47	.40
2	.63*	.40
3	.36	.53
4	.48	.45
5	.31	.57
6	.40	.46
7	.41	.47
8	.30	.48
9	.65*	.39
10	.34	.34
11	.38	.53
12	.42	.53
13	.39	.49
14	.51	.57
15	.54	.60*
16	.56	.60*
17	.57	.62*
18	.47	.34
19	.49	.42
20	.57	.40
21	.43	.41
22	.55	.45
23	.30	.54
24	.48	.60*
25	.62*	.63*
26	.40	.55
27	.45	.48
28	.43	.55
29	.67	.77*
30	.54	.80*
31	.54	.62
32	.80	.72

*Significant beyond five percent level of confidence.

MULTIPLE R's
WAVE -1 MEANS TO TOTAL REENLISTMENT

WAVE -1 MEANS AND STANDARD DEVIATIONS
TO TOTAL REENLISTMENT

Total Reenlistment By Calendar Quarter	Means: Climate Predictor To Total Reenlistment	Standard Deviations: Culture Predictor To Total Reenlistment
1	.38	.50
2	.39	.42
3	.44	.54
4	.46	.49
5	.30	.60*
6	.40	.56
7	.38	.48
8	.37	.44
9	.51	.30
10	.32	.29
11	.30	.50
12	.33	.47
13	.37	.50
14	.44	.56
15	.42	.56
16	.49	.66*
17	.54	.62*
18	.47	.43
19	.49	.45
20	.64*	.57
21	.42	.33
22	.57	.48
23	.25	.50
24	.42	.68
25	.61*	.66*
26	.43	.57
27	.49	.49
28	.56	.56
29	.73*	.67
30	.53	.77*
31	.32	.68
32	.87	.68

*Significant beyond five percent level of confidence.

APPENDIX A-2

Intercorrelation Matrix:
Total Reenlistment Over
Calendar Quarters

-MCORF OPTIONS=MATRIX VAR=ALL>

Missing Data Correlation

VARIABLE													
5192 TTM8	1.0000												
5193.TTM7	-0 (1)	1.0000											
5194.TTM6	-0. (1)	.7128 (4)	1.0000										
5195.TTM5	-0. (1)	-.0351 (4)	-.2959 (8)	1.0000									
5196.TTM4	-0. (1)	.5287 (3)	.7266 (10)	-.2527 (15)	1.0000								
5197.TTM3	-0. (1)	-.3511 (3)	.0668 (10)	.2869 (16)	.1945 (31)	1.0000							
5198.TTM2	-0. (1)	-.3924 (4)	-.2301 (11)	.1720 (19)	-.1288 (34)	.2741 (49)	1.0000						
5199.TTM1	-0. (1)	-.2669 (4)	.7244 (11)	.4085 (18)	.2263 (36)	.0431 (46)	.2243 (71)	1.0000					
5200.TT0	-0. (1)	.0540 (4)	.6009 (11)	.0134 (19)	.1719 (35)	.1458 (49)	.2087 (76)	.2842 (82)	1.0000				
5201.TT1	-0. (1)	-.0530 (4)	-.1625 (11)	.0704 (18)	-.2345 (35)	-.0759 (47)	.4375 (73)	.1756 (78)	.2911 (107)	1.0000			
5202.TT2	-0. (1)	.6795 (4)	-.0548 (11)	.1922 (18)	-.0613 (35)	-.2750 (46)	.2983 (74)	.3305 (81)	.3157 (110)	.4507 (109)	1.0000		
5203.TT3	-0. (1)	.8678 (4)	-.1990 (11)	.3055 (18)	-.1190 (35)	-.3457 (46)	.2110 (74)	.2868 (81)	.2556 (111)	.4337 (110)	.5716 (117)	1.0000	
5204.TT4	-0. (1)	-.3632 (4)	-.2492 (11)	.4891 (18)	-.0974 (35)	-.1817 (46)	.3809 (73)	.2627 (79)	.2215 (112)	.4527 (111)	.6208 (117)	.4849 (120)	
5205.TT5	-0. (1)	-.7377 (4)	-.2189 (11)	.5536 (17)	.0256 (35)	-.3241 (45)	.2870 (72)	.2675 (80)	.2970 (110)	.3529 (109)	.5769 (115)	.5139 (118)	
5206.TT6	-0. (1)	.0931 (4)	-.2152 (11)	.6215 (18)	-.0736 (35)	-.1638 (46)	.2963 (73)	.2181 (80)	.2660 (110)	.2633 (110)	.4433 (118)	.4840 (118)	
5207.TT7	-0 (1)	-.4189 (4)	.0249 (11)	.2551 (18)	-.1143 (35)	.0049 (46)	.3530 (73)	.2735 (80)	.3056 (110)	.2531 (110)	.4290 (118)	.3959 (118)	
5208.TT8	-0. (1)	-.2055 (4)	-.1239 (11)	.2482 (17)	-.1004 (35)	-.1587 (46)	.3079 (73)	.3133 (80)	.2979 (110)	.3012 (109)	.4744 (117)	.4313 (117)	
5209.TT9	-0. (1)	-.1095 (4)	-.0574 (11)	-.2160 (16)	-.0765 (35)	-.3170 (45)	.2046 (72)	.3550 (79)	.3145 (108)	.3131 (107)	.4522 (114)	.4050 (114)	
5210.TT10	-0. (1)	-.1585 (4)	-.1461 (11)	-.2413 (16)	-.0275 (35)	-.3090 (45)	.2685 (72)	.3950 (80)	.2689 (109)	.2139 (107)	.3916 (115)	.3683 (115)	

5211.TT11	-0	.1541	-.1075	.3504	-.0080	-.2563	.2736	.2747	.2948	.1907	.3921	.4360
	(1)	(4)	(11)	(17)	(35)	(46)	(73)	(80)	(110)	(109)	(117)	(117)
5212.TT12	-0	-.8593	.2638	.3862	.0481	-.2376	.2087	.3646	.3104	.1286	.3556	.3793
	(1)	(4)	(10)	(18)	(34)	(45)	(72)	(79)	(109)	(109)	(117)	(117)
5213.TT13	-0.	-.9462	.5149	.3203	.1547	-.0575	.2426	.3270	.3098	.1803	.4011	.3688
	(1)	(4)	(11)	(18)	(35)	(46)	(73)	(80)	(110)	(110)	(118)	(118)
5214.TT14	-0	.7393	.5883	.1825	.0191	-.0359	.2875	.1998	.2820	.2272	.3918	.3063
	(1)	(4)	(11)	(18)	(33)	(46)	(73)	(78)	(109)	(109)	(115)	(115)
5215.TT15	-0.	.5020	-.1028	.0847	-.1400	-.1021	.3217	.1739	.3629	.3484	.4082	.4241
	(1)	(4)	(11)	(17)	(33)	(45)	(71)	(77)	(108)	(107)	(112)	(112)
5216.TT16	-0.	.4937	.1199	-.0642	-.0054	-.0621	.2375	.1988	.3796	.3473	.3777	.3975
	(1)	(4)	(11)	(18)	(35)	(45)	(72)	(78)	(108)	(109)	(114)	(116)
5217.TT17	-0.	.5418	.4012	-.1106	-.1449	.0244	.2823	.3022	.4220	.3072	.3788	.4344
	(1)	(4)	(11)	(18)	(33)	(45)	(72)	(78)	(109)	(108)	(115)	(115)
5218.TT18	-0	.4096	.2686	-.0894	.0930	.1253	.3181	.3060	.3831	.1727	.2968	.3430
	(1)	(4)	(11)	(18)	(33)	(44)	(71)	(77)	(108)	(106)	(114)	(114)
5219.TT19	-0.	-.9878	.3461	.0764	.0298	-.0037	.1466	.3592	.3131	.0984	.3823	.4188
	(1)	(3)	(10)	(17)	(33)	(43)	(68)	(75)	(105)	(104)	(112)	(112)
5220.TT20	-0.	-.5422	.4956	.4326	.0712	-.0083	-.0534	.2691	.2758	.0302	.2773	.3512
	(1)	(4)	(11)	(18)	(34)	(44)	(71)	(77)	(108)	(107)	(115)	(115)
5221.TT21	-0.	-.1336	.3238	.5335	.0050	-.1592	.0786	2297	.3457	.2704	.4605	.4312
	(1)	(3)	(10)	(16)	(33)	(43)	(70)	(76)	(107)	(104)	(113)	(113)
5222.TT22	-0.	.3462	.2950	.5068	.0569	-.1267	.1069	.2342	.2576	.2831	.3273	3316
	(1)	(3)	(10)	(17)	(33)	(43)	(70)	(76)	(107)	(106)	(114)	(114)
5223.TT23	-0.	.9735	.3257	.5916	.1369	-.0881	.1104	.2125	.2854	.3197	.4466	4114
	(1)	(3)	(10)	(17)	(33)	(43)	(70)	(76)	(107)	(106)	(114)	(114)
5224.TT24	-0.	.9970	-.4868	.4650	.0075	-.2761	.1601	.1840	.2189	.3339	.3966	.3885
	(1)	(3)	(10)	(16)	(33)	(43)	(70)	(76)	(107)	(105)	(113)	(113)
5225.TT25	-0.	0.	-.6821	.3887	-.1605	-.2875	.2331	.1552	.2267	.3560	.3834	.4243
		(2)	(9)	(16)	(32)	(42)	(69)	(74)	(105)	(103)	(111)	(111)
5226.TT26	-0.	-0.	-.7330	.4636	-.3415	-.3985	.2765	.1939	.3474	.4052	.4190	.4023
			(7)	(14)	(31)	(41)	(67)	(73)	(104)	(103)	(111)	(111)
5227.TT27	-0.	-0.	-0.	.3429	-.1551	-.1329	.3532	.2755	.3363	.3512	.3943	.4294
				(9)	(24)	(34)	(59)	(66)	(97)	(94)	(101)	(101)
5228.TT28	-0.	-0.	-0.	-0.	.2969	-.2698	.2240	.2127	.2268	.3659	.4403	.4575
					(16)	(26)	(50)	(58)	(87)	(84)	(91)	(91)
5229.TT29	-0	-0.	-0.	-0	-0.	-.4653	.1905	.0539	.2251	.3603	.3675	.4022
						(14)	(35)	(42)	(71)	(68)	(74)	(74)
5230.TT30	0	-0.	-0	-0.	-0	-0.	.2172	.0419	.1008	.2050	.4332	.2786
							(21)	(30)	(57)	(53)	(60)	(59)

5231 TT31	-0.	-0.	-0	-0.	-0.	-0.	-0.	.4464 (12)	.1484 (37)	-.0673 (33)	.4280 (37)	.1732 (38)
5232.TT32	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-0	.1537 (26)	-.3506 (24)	.4013 (25)	.2863 (25)

	5192. TTM8	5193. TTM7	5194. TTM6	5195. TTM5	5196. TTM4	5197. TTM3	5198. TTM2	5199. TTM1	5200. TT0	5201. TT1	5202. TT2	5203. TT3
5204.TT4	1.0000											
5205.TT5	.7493 (120)	1.0000										
5206.TT6	.5481 (121)	.8028 (123)	1.0000									
5207.TT7	.4679 (121)	.6962 (123)	.8871 (129)	1.0000								
5208.TT8	.4242 (120)	.6238 (122)	.7594 (128)	.8717 (129)	1.0000							
5209.TT9	.4091 (117)	.5239 (121)	.6230 (125)	.7362 (126)	.8386 (126)	1.0000						
5210.TT10	.3161 (118)	.4326 (122)	.5059 (125)	.6064 (126)	.7033 (126)	.8533 (125)	1.0000					
5211.TT11	.3436 (120)	.5089 (122)	.5874 (128)	.6343 (129)	.7012 (129)	.7082 (126)	.8277 (126)	1.0000				
5212.TT12	.3436 (120)	.5633 (122)	.6333 (128)	.6415 (129)	.5990 (128)	.5792 (125)	.6314 (125)	.8101 (128)	1.0000			
5213.TT13	.4103 (121)	.5854 (123)	.5909 (129)	.5991 (130)	.5717 (129)	.5912 (126)	.6308 (126)	.7246 (129)	.8599 (129)	1.0000		
5214.TT14	.4023 (118)	.5549 (120)	.5952 (126)	.6026 (126)	.5469 (125)	.4934 (123)	.4647 (122)	.5753 (125)	.6501 (125)	.7716 (126)	1.0000	
5215.TT15	.4840 (115)	.6069 (117)	.6323 (123)	.6541 (124)	.6237 (124)	.5518 (122)	.5054 (121)	.5927 (124)	.6362 (123)	.6784 (124)	.8080 (123)	1.0000
5216.TT16	.4003 (118)	.4944 (120)	.5559 (125)	.6108 (126)	.6408 (125)	.5395 (123)	.4317 (122)	.5327 (125)	.5208 (125)	.5238 (126)	.6557 (123)	.8200 (122)
5217.TT17	.4353 (118)	.5424 (120)	.5760 (126)	.6357 (127)	.6414 (126)	.5440 (123)	.4714 (123)	.6011 (126)	.5782 (126)	.5645 (127)	.6159 (125)	.7225 (124)
5218.TT18	.3362 (116)	.4728 (118)	.5004 (123)	.5648 (124)	.5688 (123)	.4407 (120)	.4190 (121)	.5274 (123)	.5187 (123)	.4249 (124)	.4632 (122)	.5535 (121)
5219.TT19	.3995 (115)	.4426 (117)	.4263 (122)	.4640 (123)	.4888 (122)	.3564 (119)	.3226 (120)	.4432 (122)	.4600 (122)	.4584 (123)	.3919 (120)	.4706 (119)
5220.TT20	.2790 (118)	.3238 (119)	.2688 (124)	.2642 (125)	.2345 (124)	.2543 (121)	.1972 (122)	.2030 (124)	.2765 (124)	.3948 (125)	.3493 (122)	.2768 (121)

5221.TT21	.4199 (115)	.4620 (117)	.3751 (123)	.3571 (123)	.3363 (123)	.3359 (120)	.2703 (120)	.3399 (123)	.4026 (122)	.4362 (123)	.3306 (121)	.3076 (120)
5222.TT22	.4014 (117)	.3784 (119)	.3990 (125)	.3784 (126)	3362 (125)	.3919 (122)	.2807 (122)	.3212 (125)	.3912 (125)	.4340 (126)	.3287 (123)	.3063 (122)
5223.TT23	.4729 (117)	.4271 (119)	.4247 (125)	.3762 (126)	.3539 (125)	.4070 (122)	.2812 (122)	.3518 (125)	.3970 (125)	.4344 (126)	.4016 (123)	.4190 (122)
5224.TT24	.4088 (116)	.3580 (118)	.4024 (124)	.3492 (125)	.3542 (125)	.4085 (122)	.3178 (122)	.3498 (125)	.4535 (124)	.4226 (125)	.3847 (122)	.4663 (122)
5225.TT25	.4185 (114)	.4172 (117)	.4091 (122)	.3671 (123)	.3644 (122)	.3761 (120)	.3424 (120)	.4098 (122)	.4430 (122)	.3761 (123)	.3395 (120)	.4622 (119)
5226.TT26	.3577 (114)	.3956 (116)	.3569 (121)	.2572 (122)	.2781 (121)	.3059 (118)	.3408 (119)	.3112 (121)	.4032 (121)	.3405 (122)	.3124 (119)	.3940 (118)
5227.TT27	.2567 (104)	3869 (107)	.3697 (112)	.4100 (113)	.4431 (113)	.3975 (111)	.4372 (111)	.4515 (113)	.4852 (113)	.4461 (113)	.3966 (110)	.4648 (111)
5228.TT28	.3518 (94)	.4489 (97)	.4346 (101)	.4583 (102)	.4788 (102)	.4925 (101)	.5031 (101)	.4919 (102)	.4643 (102)	.4426 (102)	.3868 (99)	.4869 (100)
5229.TT29	.3999 (77)	.3609 (81)	.3479 (85)	.3650 (86)	.4129 (86)	.3282 (85)	.2719 (85)	.3328 (86)	.2749 (86)	.3461 (86)	.2791 (84)	.3374 (85)
5230.TT30	.3715 (61)	.4071 (65)	.3618 (69)	.3199 (70)	.3441 (70)	.2696 (69)	.2150 (69)	.2987 (70)	.3027 (70)	.3389 (70)	.3138 (68)	.2249 (69)
5231.TT31	.3937 (39)	.4894 (43)	.3920 (46)	.4095 (47)	.4399 (47)	.2677 (46)	.2478 (46)	.3510 (47)	.4839 (47)	.5010 (47)	.3196 (45)	.2983 (46)
5232.TT32	.2554 (27)	.3615 (26)	.1841 (29)	.2457 (30)	.2783 (30)	.3089 (30)	.2864 (29)	.2877 (30)	.4449 (30)	.4557 (30)	.0465 (29)	.1507 (30)

	5204. TT4	5205. TT5	5206. TT6	5207. TT7	5208. TT8	5209. TT9	5210. TT10	5211. TT11	5212. TT12	5213. TT13	5214. TT14	5215. TT15
5216.TT16	1.0000											
5217.TT17	.8714 (124)	1.0000										
5218.TT18	.6516 (121)	.7506 (124)	1.0000									
5219.TT19	.5792 (120)	.5665 (122)	.6511 (121)	1.0000								
5220.TT20	.3426 (122)	.2777 (124)	.2823 (123)	.7191 (122)	1.0000							
5221.TT21	.4097 (120)	.3631 (122)	.3020 (121)	.4109 (120)	.5286 (121)	1.0000						
5222.TT22	.4032 (123)	.4122 (125)	.3168 (123)	.2652 (123)	.4037 (124)	.7394 (123)	1.0000					

5223.TT23	.4924	.4551	.2772	.2729	.3872	.6168	.8289	1.0000				
	(123)	(125)	(123)	(123)	(124)	(123)	(126)					
5224.TT24	.4645	.3938	.3239	.2751	.2732	.5205	.6525	.7491	1.0000			
	(122)	(124)	(122)	(122)	(123)	(123)	(125)	(125)				
5225.TT25	.5650	.4975	.4067	.4162	.3079	.4269	.4262	.5334	.7180	1.0000		
	(120)	(122)	(120)	(120)	(121)	(120)	(123)	(123)	(122)			
5226.TT26	.4193	.3560	.2632	.2148	.1377	.3085	.3051	.3271	.4792	.5959	1.0000	
	(119)	(121)	(120)	(120)	(121)	(119)	(122)	(122)	(121)	(120)		
5227.TT27	.5301	.5067	.4651	.3735	.2401	.3127	.4105	.3780	.4333	.4910	.6117	1.0000
	(110)	(112)	(110)	(110)	(111)	(111)	(113)	(113)	(113)	(112)	(112)	
5228.TT28	.4972	.5227	.4182	.3674	.2244	.2824	.4631	.4646	.4744	.4825	.5030	.8065
	(99)	(101)	(99)	(99)	(101)	(100)	(102)	(102)	(102)	(101)	(101)	(102)
5229.TT29	.3930	.4415	.3902	.3084	.1434	.2189	.3537	.4037	.3621	.4545	.2362	.6056
	(83)	(86)	(84)	(83)	(84)	(84)	(86)	(86)	(86)	(85)	(85)	(86)
5230.TT30	.2429	.2983	.3127	.1646	.0337	.2762	.2934	.3524	.3128	.2888	.4904	.2817
	(67)	(70)	(69)	(67)	(68)	(69)	(70)	(70)	(70)	(69)	(69)	(70)
5231.TT31	.3938	.3641	.3025	.3903	.1141	.2439	.2004	.3786	.4791	.3850	.4385	.4465
	(46)	(47)	(46)	(46)	(45)	(46)	(47)	(47)	(47)	(46)	(46)	(47)
5232.TT32	.3204	.3469	.2102	.3211	.1622	.1462	.1974	.3019	.3610	.3728	.1392	.4158
	(30)	(30)	(29)	(29)	(29)	(29)	(30)	(30)	(30)	(30)	(29)	(30)
	5216. TT16	5217. TT17	5218. TT18	5219. TT19	5220. TT20	5221. TT21	5222. TT22	5223. TT23	5224. TT24	5225. TT25	5226. TT26	5227. TT27

5228 TT28	1.0000				
5229.TT29	.7833	1.0000			
	(85)				
5230.TT30	.4578	.4888	1.0000		
	(69)	(70)			
5231.TT31	.5261	.5120	.7853	1.0000	
	(46)	(47)	(47)		
5232.TT32	.5747	.5718	.4611	.8921	1.0000
	(30)	(30)	(30)	(30)	
	5228. TT28	5229. TT29	5230. TT30	5231. TT31	5232. TT32

<DEL VAR=ALL>

<READ INTERNAL FILE=NA.MIDAS VAR=190-201,1190-1195>

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Read Observations
FROM INTERNAL FILE "NA.MIDAS"

<CODE V1000=COUNT VAR=196-201 LABEL=WM1>

COUNT Categorization

     VARIABLE  TOTAL  VALID   MISS LEVELS

1000.WM1          173     54    119 6
```

APPENDIX A-3

Multiple Correlations To Readiness

MULTIPLE R's

WAVE 1 CLIMATE MEANS TO OVERALL READINESS

Overall Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.19	.22
2	.15	.23
3	.26	.34
4	.26	.30
5	.35	.40
6	.30	.34
7	.37	.40
8	.40*	.43*
9	.39*	.39
10	.25	.28
11	.31	.31
12	.33	.35
13	.41*	.40
14	.32	.32
15	.37	.40
16	.29	.29
17	.38	.38
18	.36	.38
19	.42*	.46*
20	.36	.36
21	.36	.36
22	.34	.34
23	.34	.35
24	.29	.29
25	.29	.30
26	.33	.36
27	.48	.48
28	.50	.62
29	.57	.57

*Not significant beyond five percent level of confidence.

MULTIPLE R's

WAVE 1 CLIMATE MEANS TO PERSONNEL READINESS

Personnel Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.47*	.46*
2	.52*	.51*
3	.52*	.53*
4	.28	.30
5	.24	.27
6	.21	.21
7	.27	.27
8	.24	.24
9	.23	.25
10	.26	.23
11	.25	.23
12	.33	.33
13	.30	.30
14	.29	.29
15	.34	.37
16	.36	.35
17	.39	.40
18	.44*	.47*
19	.42*	.43*
20	.41*	.42*
21	.42*	.42*
22	.44*	.45*
23	.48*	.50*
24	.51*	.52*
25	.48*	.48*
26	.56*	.56*
27	.45	.47
28	.72*	.73*
29	.72	.72

*Not significant beyond five percent level of confidence.

MULTIPLE R's

WAVE 1 CLIMATE MEANS TO TRAINING READINESS

Training Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.26	.32
2	.16	.22
3	.31	.35
4	.28	.30
5	.20	.23
6	.31	.35
7	.35	.40
8	.37	.41*
9	.40*	.42*
10	.27	.35
11	.39*	.45*
12	.34	.36
13	.44*	.40
14	.32	.31
15	.30	.30
16	.29	.31
17	.40*	.42*
18	.42*	.42*
19	.34	.34
20	.38	.38
21	.31	.34
22	.31	.35
23	.26	.33
24	.32	.35
25	.37	.38
26	.41	.42
27	.53	.53
28	.65	.66
29	.68	.71

*Not significant beyond five percent level of confidence.

MULTIPLE R's
WAVE 2 CLIMATE MEANS TO OVERALL READINESS

Overall Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
0	.40	.41
1	.20	.27*
2	.22	.30*
3	.12	.20*
4	.14	.15*
5	.42	.45
6	.29	.28*
7	.34	.37*
8	.32	.36*
9	.29	.28*
10	.33	.30*
11	.30	.28*
12	.29	.32*
13	.24	.26*
14	.24	.26*
15	.28	.32*
16	.27	.28*
17	.31	.29*
18	.17	.17*
19	.20	.22*
20	.16	.17*
21	.19	.19*
22	.30	.31*
23	.27	.28*
24	.26	.26*
25	.34	.34*
26	.47	.47*
27	.38	.42*
28	.60	.62*
29	.62	.62*

*Not significant beyond five percent level of confidence.

MULTIPLE R's

WAVE 2 CLIMATE MEANS TO PERSONNEL READINESS

Personnel Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.40*	.41
2	.37	.37
3	.38	.39
4	.29	.30
5	.36	.38
6	.46*	.47*
7	.48*	.49*
8	.38	.39
9	.36	.36
10	.33	.31
11	.23	.22
12	.25	.29
13	.19	.30
14	.22	.24
15	.35	.38
16	.33	.33
17	.35	.36
18	.38	.44*
19	.38	.42
20	.36	.38
21	.33	.37
22	.37	.38
23	.50*	.51*
24	.55*	.56*
25	.47*	.47*
26	.50*	.53*
27	.61*	.64*
28	.76*	.76*
29	.61	.62

*Not significant beyond five percent level of confidence.

MULTIPLE R's

WAVE 2 CLIMATE MEANS TO TRAINING READINESS

Training Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.31	.39
2	.32	.37
3	.23	.25
4	.24	.24
5	.42*	.42
6	.27	.33
7	.39	.43*
8	.37	.42*
9	.42*	.44*
10	.32	.35
11	.36	.40
12	.29	.32
13	.31	.30
14	.29	.32
15	.26	.28
16	.32	.35
17	.32	.30
18	.23	.24
19	.24	.25
20	.23	.24
21	.22	.23
22	.45*	.46*
23	.38	.42
24	.35	.37
25	.36	.38
26	.49	.49
27	.58*	.59*
28	.71*	.72*
29	.74	.74

*Not significant beyond five percent level of confidence.

MULTIPLE R's

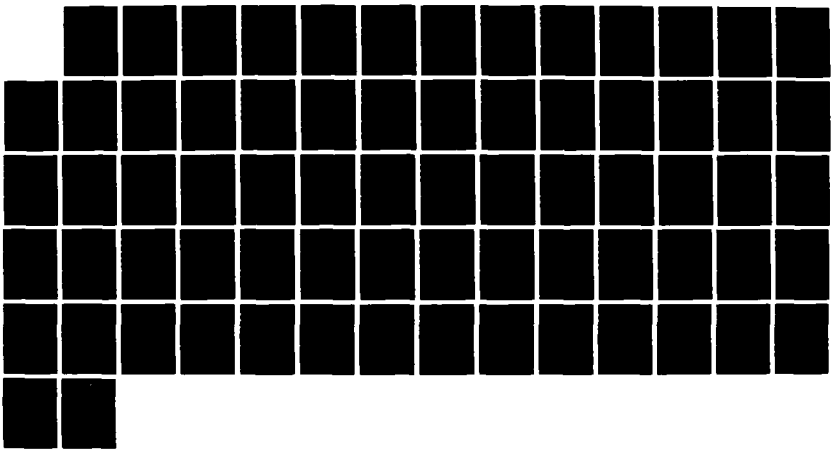
WAVE 1 CULTURE STANDARD DEVIATIONS TO OVERALL READINESS

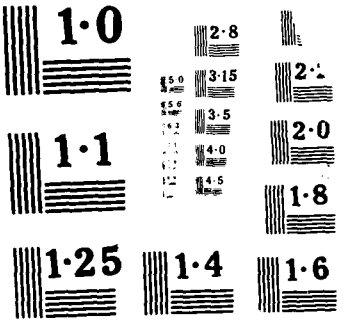
Overall Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
0	.30	.32*
1	.33	.34*
2	.23	.27*
3	.24	.23*
4	.32	.32*
5	.30	.33*
6	.28	.28*
7	.24	.27*
8	.28	.32*
9	.23	.25*
10	.28	.30*
11	.24	.27*
12	.18	.26*
13	.26	.29*
14	.18	.22*
15	.19	.28*
16	.22	.23*
17	.29	.29*
18	.22	.24*
19	.28	.30*
20	.18	.19*
21	.18	.18*
22	.27	.28*
23	.22	.23*
24	.23	.23*
25	.17	.19*
26	.18	.23*
27	.45	.46*
28	.46	.51*
29	.54	.55*

*Not significant beyond five percent level of confidence.

AD-A191 419 TEST OF THE CONSTANCY - VELOCITY HYPOTHESIS: NAVY UNIT FUNCTIONING AND PERFORMANCE OVER 12 YEARS(U) RENSIS LIKERT ASSOCIATES INC ANN ARBOR MI D G BOWERS ET AL. 31 JAN 88 2/2

UNCLASSIFIED F/G 5/9 NL

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MULTIPLE R's

WAVE 1 CULTURE STANDARD DEVIATIONS TO PERSONNEL READINESS

Personnel Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.25	.27
2	.25	.25
3	.22	.22
4	.25	.28
5	.25	.27
6	.33	.34
7	.30	.31
8	.27	.26
9	.33	.34
10	.38	.41
11	.33	.36
12	.41*	.46*
13	.36	.38
14	.31	.34
15	.38	.44*
16	.30	.31
17	.33	.33
18	.44*	.45*
19	.36	.36
20	.50*	.51*
21	.46*	.46*
22	.46*	.46*
23	.38	.39
24	.47*	.48*
25	.58*	.58*
26	.46	.49
27	.40	.45
28	.73*	.74*
29	.54	.56

*Not significant beyond five percent level of confidence.

MULTIPLE R's
WAVE 1 CULTURE STANDARD DEVIATIONS TO TRAINING READINESS

Training Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.31	.34
2	.35	.37
3	.27	.26
4	.30	.29
5	.29	.32
6	.34	.42
7	.32	.38
8	.32	.38
9	.34	.40
10	.27	.33
11	.36	.41*
12	.32	.26
13	.32	.30
14	.19	.22
15	.21	.22
16	.30	.30
17	.36	.36
18	.33	.33
19	.34	.34
20	.25	.25
21	.20	.22
22	.21	.27
23	.20	.27
24	.20	.26
25	.29	.32
26	.29	.29
27	.50	.51
28	.58	.58
29	.69	.69

*Not significant beyond five percent level of confidence.

MULTIPLE R's

WAVE 2 CULTURE STANDARD DEVIATIONS TO OVERALL READINESS

Overall Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
0	.30*	.31
1	.26*	.28
2	.27*	.35
3	.25*	.30
4	.38*	.40
5	.30*	.36
6	.33*	.34
7	.31*	.33
8	.34*	.37
9	.38*	.38
10	.42*	.42
11	.25*	.30
12	.19*	.22
13	.24*	.24
14	.30*	.29
15	.33*	.37
16	.35*	.37
17	.40*	.38
18	.34*	.34
19	.28*	.29
20	.27*	.27
21	.23*	.23
22	.19*	.19
23	.32*	.32
24	.22*	.22
25	.24*	.25
26	.20*	.21
27	.39*	.43
28	.45*	.47
29	.68*	.68

*Not significant beyond five percent level of confidence.

MULTIPLE R's
WAVE 2 CULTURE STANDARD DEVIATIONS TO PERSONNEL READINESS

Personnel Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.22	.27
2	.27	.27
3	.28	.29
4	.26	.27
5	.32	.34
6	.30	.30
7	.36	.36
8	.41*	.42
9	.39	.39
10	.34	.37
11	.30	.31
12	.34	.37
13	.27	.34
14	.33	.34
15	.31	.34
16	.27	.29
17	.27	.29
18	.32	.38
19	.28	.31
20	.27	.29
21	.29	.31
22	.29	.30
23	.22	.23
24	.33	.33
25	.46*	.47*
26	.43	.45
27	.26	.35
28	.43	.44
29	.60	.74

*Not significant beyond five percent level of confidence

MULTIPLE R's

WAVE 2 CULTURE STANDARD DEVIATIONS TO TRAINING READINESS

Training Readiness By Calendar Quarter	Proposition #1 Climate/Culture Predictor To Total Reenlistment	Proposition #4 Velocity As Added Predictor
1	.29	.33
2	.34	.39
3	.26	.31
4	.29	.30
5	.32	.35
6	.31	.40
7	.47*	.50*
8	.41*	.45*
9	.46*	.50*
10	.43*	.48*
11	.18	.31
12	.19	.24
13	.30	.32
14	.17	.16
15	.27	.29
16	.24	.31
17	.34	.34
18	.30	.32
19	.20	.20
20	.25	.26
21	.34	.35
22	.31	.32
23	.45*	.47*
24	.38	.39
25	.37	.38
26	.24	.25
27	.40	.44
28	.59	.60
29	.62	.69

*Not significant beyond five percent level of confidence.

MULTIPLE R's

WAVE -1 CLIMATE TO READINESS

Calendar Quarters	Overall Readiness	Personnel Readiness	Training Readiness
1	.52	.37	.63*
2	.53	.26	.68*
3	.54	.37	.56
4	.51	.32	.52
5	.38	.19	.33
6	.56	.52	.49
7	.46	.50	.60*
8	.50	.53	.48
9	.52	.40	.56
10	.45	.47	.47
11	.36	.48	.44
12	.46	.31	.40
13	.58	.21	.50
14	.34	.25	.48
15	.34	.22	.47
16	.52	.30	.60
17	.57	.44	.42
18	.54	.60	.51
19	.52	.54	.56
20	.45	.39	.53
21	.37	.47	.53
22	.50	.52	.64*
23	.36	.47	.33
24	.58	.44	.35
25	.56	.58	.41
26	.68	.54	.64
27	.59	.31	.60
28	.78	.77	.64
29	.98	.66	.86

*Significant beyond five percent level of confidence.

MULTIPLE R's

WAVE -1 CULTURE TO READINESS

Calendar Quarters	Overall Readiness	Personnel Readiness	Training Readiness
1	.20	.44	.26
2	.40	.25	.46
3	.44	.25	.38
4	.44	.49	.46
5	.16	.47	.38
6	.40	.40	.43
7	.19	.50	.43
8	.53	.36	.50
9	.50	.45	.47
10	.41	.45	.38
11	.47	.31	.38
12	.37	.28	.34
13	.43	.26	.32
14	.39	.24	.34
15	.37	.34	.32
16	.41	.32	.39
17	.35	.36	.44
18	.51	.32	.53
19	.56	.27	.49
20	.50	.18	.41
21	.33	.38	.25
22	.36	.37	.49
23	.42	.37	.43
24	.42	.31	.46
25	.58	.48	.51
26	.48	.46	.68
27	.58	.62	.46
28	.64	.80	.48
29	.89	.93	.88

APPENDIX A-4

Intercorrelation Of Overall Readiness Over Calendar Quarters

<MCORR OPTIONS=MATRIX VAR=ALL STRAT=NONE>

Missing Data Correlation

VARIABLE											
8002.OVM18	1.0000										
8003.OVM17	-0. (1)	1.0000									
8004.OVM16	-0. (1)	.3954 (4)	1.0000								
8005.OVM15	-0. (1)	.0235 (4)	.4330 (11)	1.0000							
8006.OVM14	-0. (1)	.0010 (4)	.5379 (11)	.7330 (19)	1.0000						
8007.OVM13	-0. (1)	.9477 (4)	.4407 (11)	.2710 (19)	.5045 (38)	1.0000					
8008.OVM12	-0. (1)	.5994 (4)	.9124 (11)	.3424 (19)	.4489 (38)	.5390 (53)	1.0000				
8009.OVM11	-0. (1)	.9309 (4)	.7991 (11)	.4087 (19)	.3519 (38)	.4126 (53)	.5247 (72)	1.0000			
8010.OVM10	-0. (1)	.8136 (4)	.4573 (11)	.1615 (19)	.2306 (38)	.2921 (53)	.5432 (72)	.6884 (83)	1.0000		
8011.OVM9	-0. (1)	.7352 (4)	-.2026 (11)	-.2586 (19)	.0996 (38)	.2100 (53)	.2094 (72)	.3013 (83)	.4406 (105)	1.0000	
8012.OVM8	-0. (1)	7299 (4)	-.1790 (11)	-.1894 (19)	-.0494 (38)	.1006 (53)	.0683 (72)	.2132 (83)	.3060 (105)	.6124 (106)	1.0000
8013.OVM7	-0. (1)	.6535 (4)	-.4180 (11)	-.4029 (19)	-.2964 (38)	.1258 (53)	.0912 (72)	-.0152 (83)	.1580 (105)	.5135 (106)	.6259 (106)
8014.OVM6	-0. (1)	.7206 (4)	-.0133 (11)	-.0558 (19)	.1766 (38)	.2611 (53)	-.0629 (72)	-.0388 (83)	.0109 (105)	.2689 (106)	.3819 (106)
8015.OVM5	-0. (1)	.7397 (4)	.3900 (11)	.2063 (19)	-.0215 (38)	.1474 (53)	.1558 (72)	.0819 (83)	.2308 (105)	.2825 (106)	.3319 (106)
8016.OVM4	-0. (1)	.9309 (4)	.2830 (11)	.3947 (19)	.2597 (38)	.1204 (53)	.0996 (72)	.0837 (83)	.1348 (105)	.2596 (106)	.2069 (106)
8017.OVM3	-0. (1)	.9018 (4)	.0621 (11)	.2471 (19)	.0352 (38)	-.0166 (53)	-.1153 (72)	-.0822 (83)	1559 (105)	.0932 (106)	.2047 (106)
8018.OVM2	-0. (1)	.5974 (4)	.1007 (11)	.2593 (19)	-.1751 (38)	-.1709 (53)	-.2001 (72)	-.1349 (83)	.0582 (105)	.1293 (106)	.1822 (106)
8019.OVM1	-0. (1)	.5206 (4)	.1296 (11)	.3590 (19)	-.0318 (38)	.1141 (53)	.0138 (72)	-.1280 (83)	.0728 (105)	.2033 (106)	.2019 (106)
8020.OVO	-0. (1)	.8417 (4)	-.2982 (11)	.0882 (19)	-.2124 (38)	.0573 (53)	-.0858 (72)	-.2029 (83)	-.0231 (105)	.1416 (106)	.2507 (106)

VARIABLE											
8002.OVM18											
8003.OVM17											
8004.OVM16											
8005.OVM15											
8006.OVM14											
8007.OVM13											
8008.OVM12											
8009.OVM11											
8010.OVM10											
8011.OVM9											
8012.OVM8											
8013.OVM7											
8014.OVM6	.4963 (106)										
8015.OVM5	.4683 (106)	.6259 (106)									
8016.OVM4	.2929 (106)	.3319 (106)	.3819 (106)								
8017.OVM3	.0653 (106)	.2069 (106)	.2047 (106)	.0932 (106)							
8018.OVM2	.0855 (106)	.1822 (106)	.1293 (106)	.1559 (106)	.1416 (106)						
8019.OVM1	.1493 (106)	.2019 (106)	.2033 (106)	.1348 (106)	.0728 (106)	.0582 (106)					
8020.OVO	.2426 (106)	.2507 (106)	.1416 (106)	.0832 (106)	.0231 (106)	.0858 (106)	.0138 (106)				

8021.0V1	-0	-.8536	-.1903	-.0938	-.1360	.1660	-.0307	-.1112	-.0652	.1419	.2555	.1917
	(1)	(4)	(11)	(19)	(38)	(53)	(72)	(83)	(105)	(106)	(106)	(106)
8022.0V2	-0.	-.9821	.1764	.1991	.3094	.1979	.1766	.0926	-.0248	.2013	.1608	.1055
	(1)	(4)	(11)	(19)	(38)	(53)	(72)	(83)	(105)	(106)	(106)	(106)
8023.0V3	-0.	-.7642	.1909	.0849	.1376	.0437	.1974	.0582	.0938	.2528	.2540	.2542
	(1)	(4)	(11)	(19)	(38)	(53)	(72)	(83)	(105)	(106)	(106)	(106)
8024.0V4	-0	-.4039	.1817	.2018	-.0948	-.0601	.1003	.1656	.1525	.0848	.1020	.1555
	(1)	(4)	(11)	(19)	(37)	(52)	(71)	(82)	(104)	(105)	(105)	(105)
8025.0V5	-0.	-.9304	-.0734	.4683	.3131	.0254	.0407	.0832	.0929	.0663	.0457	.0549
	(1)	(4)	(11)	(19)	(37)	(52)	(71)	(81)	(103)	(104)	(104)	(104)
8026.0V6	-0.	-.9289	-.2145	.4222	.3334	.1497	.1726	.1686	.1026	.1119	.0829	.0709
	(1)	(4)	(11)	(19)	(37)	(52)	(71)	(81)	(103)	(104)	(104)	(104)
8027.0V7	-0.	-.9337	-.3750	.1056	.4186	.1852	.0750	-.0824	-.0110	.0448	.0877	-.0470
	(1)	(4)	(11)	(19)	(37)	(52)	(71)	(81)	(103)	(104)	(104)	(104)
8028.0V8	-0.	-.9088	-.4386	-.1959	.2206	.2922	.1538	-.0459	.0601	.1870	.1454	.0989
	(1)	(4)	(11)	(19)	(36)	(51)	(70)	(80)	(101)	(102)	(102)	(102)
8029.0V9	-0.	-1.0000	-.2809	.0968	.3030	.2714	.0570	-.0819	-.0428	.1544	.0458	.0871
	(1)	(4)	(11)	(19)	(36)	(51)	(70)	(80)	(101)	(102)	(102)	(102)
8030.0V10	-0.	-.9214	-.2502	-.2579	.0218	.1823	.2057	-.0764	-.0913	.0293	.1705	.1829
	(1)	(4)	(11)	(19)	(36)	(51)	(70)	(80)	(101)	(102)	(102)	(102)
8031.0V11	-0.	-.3067	-.2767	-.2243	.0055	.2377	.1009	-.0753	-.0968	.0443	.1180	.1932
	(1)	(4)	(11)	(19)	(36)	(51)	(70)	(80)	(101)	(102)	(102)	(102)
8032.0V12	-0.	-.2943	-.5081	-.3670	.0412	.1937	.0422	-.1554	-.2125	-.0008	-.0440	.1350
	(1)	(4)	(11)	(19)	(36)	(51)	(70)	(80)	(101)	(101)	(101)	(101)
8033.0V13	-0.	-.3136	-.2798	-.1790	-.0059	.0368	.0114	-.1653	-.1504	-.0387	.0382	.2124
	(1)	(4)	(11)	(19)	(36)	(50)	(69)	(79)	(101)	(101)	(101)	(101)
8034.0V14	-0.	-.7844	-.2743	-.2265	-.0950	.0017	-.1190	-.2145	.0100	.0108	.0669	.2162
	(1)	(3)	(10)	(18)	(35)	(49)	(68)	(78)	(100)	(100)	(100)	(100)
8035.0V15	-0.	-.9826	.1792	.0848	-.0833	.0667	-.0622	-.0481	-.0766	-.0120	.0171	.0536
	(1)	(3)	(10)	(18)	(35)	(49)	(68)	(78)	(100)	(100)	(100)	(100)
8036.0V16	-0.	-.2327	.0279	-.0913	-.0582	.1624	.0647	.0544	.0809	.2187	.1534	.1477
	(1)	(3)	(10)	(18)	(35)	(49)	(68)	(78)	(100)	(100)	(100)	(100)
8037.0V17	-0.	-.9545	.1465	.0758	.0332	.1376	.1439	.0767	.1351	.1839	.1982	.1349
	(1)	(3)	(10)	(18)	(34)	(48)	(67)	(77)	(99)	(99)	(99)	(99)
8038.0V18	-0	-.7725	-.3495	.0514	.0123	.2244	.0862	.0506	.1935	.2738	.2118	.1666
	(1)	(3)	(10)	(18)	(34)	(47)	(66)	(76)	(98)	(98)	(98)	(98)
8039.0V19	-0	-.9555	-.3116	.0406	.1680	.3178	.1795	.0373	.2084	.1613	.1321	.0872
	(1)	(3)	(10)	(18)	(35)	(48)	(67)	(77)	(99)	(99)	(99)	(99)
8040.0V20	-0.	-.7689	-.3446	.3151	.0551	.2374	.1953	.1068	.2946	.2303	.2276	.1582
	(1)	(3)	(10)	(18)	(35)	(48)	(67)	(77)	(99)	(99)	(99)	(99)

8041.OV21	-0. (1)	-.9775 (3)	-.0735 (10)	.1483 (18)	.1053 (35)	.3567 (48)	.2057 (67)	.0978 (77)	.2535 (99)	.1258 (99)	.2733 (99)	.2043 (99)
8042.OV22	-0.	-1.0000 (2)	-.0118 (9)	.2481 (17)	.0611 (34)	.2438 (47)	.1901 (66)	.0853 (76)	.1864 (98)	.0580 (98)	.1426 (98)	.1572 (98)
8043.OV23	-0.	-0.	.1936 (7)	.2088 (15)	.1143 (32)	.2370 (45)	.2143 (64)	.1141 (74)	.2388 (96)	.1640 (96)	.2501 (96)	.2877 (96)
8044.OV24	-0.	-0.	-0.	.7643 (8)	.2739 (25)	.2013 (38)	.1637 (57)	.0577 (67)	.0802 (89)	.1547 (89)	.1540 (89)	.1758 (89)
8045.OV25	-0.	-0.	-0.	-0.	.2730 (16)	.1479 (29)	.2049 (48)	-.0670 (58)	.0626 (80)	.1725 (80)	.1249 (80)	.0617 (80)
8046.OV26	-0.	-0.	-0	-0.	-0.	.3621 (12)	.4049 (31)	.1501 (41)	-.0791 (63)	.0621 (63)	.0549 (63)	.0247 (63)
8047.OV27	-0.	-0.	-0.	-0.	-0.	-0.	.1523 (19)	-.2759 (29)	-.3042 (51)	.0189 (51)	.1176 (51)	.1702 (51)
8048.OV28	-0.	-0.	-0.	-0.	-0.	-0.	-0.	-.6024 (10)	-.4893 (32)	-.1849 (32)	-.1358 (32)	.0202 (32)
8049.OV29	-0.	-0.	-0.	-0	-0.	-0.	-0.	-0.	-.4306 (21)	.0877 (21)	.0373 (21)	.1064 (21)

	8002. OVM18	8003. OVM17	8004. OVM16	8005. OVM15	8006. OVM14	8007. OVM13	8008. OVM12	8009. OVM11	8010. OVM10	8011. OVM9	8012. OVM8	8013. OVM7
8014 OVM6	1.0000											
8015 OVM5	.7172 (106)	1.0000										
8016 OVM4	.5604 (106)	.6528 (106)	1.0000									
8017 OVM3	.1392 (106)	.3686 (106)	.4885 (106)	1.0000								
8018 OVM2	.1107 (106)	.2763 (106)	.3777 (106)	.7132 (106)	1.0000							
8019 OVM1	.1876 (106)	.2853 (106)	.3565 (106)	.5310 (106)	.6972 (108)	1.0000						
8020 OVO	.1281 (106)	.2212 (106)	.1041 (106)	.3341 (106)	.4553 (108)	.7417 (110)	1.0000					
8021 OV1	.2086 (106)	.2476 (106)	.2509 (106)	.1807 (106)	.3775 (108)	.5511 (110)	.5861 (110)	1.0000				
8022 OV2	.1624 (106)	.1980 (106)	.3218 (106)	.0035 (106)	.1789 (108)	.3414 (110)	.2599 (110)	.6064 (110)	1.0000			
8023 OV3	-.0552 (106)	.0267 (106)	.1053 (106)	-.0812 (106)	.0510 (108)	.1918 (110)	.2300 (110)	.3965 (110)	.5917 (110)	1.0000		

8021 OV4	1231 (105)	1136 (105)	2001 (105)	0248 (105)	1711 (107)	0986 (109)	0706 (109)	1712 (109)	.3680 (109)	.5497 (109)	1.0000	
8025 OV5	1173 (104)	0898 (104)	0809 (104)	0237 (104)	0383 (106)	0815 (108)	-.0141 (108)	-.0427 (108)	.0595 (108)	.2484 (108)	.4514 (108)	1.0000
8026 OV6	0913 (104)	0698 (104)	0027 (104)	0693 (104)	0295 (106)	.0958 (108)	.1374 (108)	0243 (108)	.0910 (108)	.2375 (108)	.3734 (108)	.6410 (109)
8027 OV7	0359 (104)	-.1554 (104)	0644 (104)	0252 (104)	0010 (106)	0812 (108)	.0247 (108)	.0073 (108)	.1142 (108)	.2525 (108)	.2950 (108)	5400 (109)
8028 OV8	1212 (102)	-.0385 (102)	0170 (102)	-.0589 (102)	-.0475 (104)	.0174 (106)	.0116 (106)	.0426 (106)	.0473 (106)	.1302 (106)	.1065 (106)	3666 (107)
8029 OV9	1925 (102)	.0995 (102)	1241 (102)	-.0150 (102)	.0346 (104)	.0034 (106)	-.0784 (106)	-.1142 (106)	.0742 (106)	.1143 (106)	.2248 (106)	.2946 (107)
8030 OV10	1488 (102)	1325 (102)	.1161 (102)	-.0401 (102)	-.0185 (104)	-.0446 (106)	-.0139 (106)	.0338 (106)	.1938 (106)	.1924 (106)	.1956 (106)	.1677 (107)
8031 OV11	2133 (102)	.2522 (102)	.3039 (102)	.0579 (102)	.0644 (104)	.1177 (106)	.0687 (106)	.2144 (106)	.3409 (106)	2838 (106)	.3431 (106)	.2251 (107)
8032 OV12	1565 (101)	1372 (101)	.2759 (101)	-.0021 (101)	.0891 (103)	.1117 (105)	.0971 (105)	2558 (105)	.2751 (105)	2823 (105)	.2852 (105)	.2190 (106)
8033 OV13	.1286 (101)	1092 (101)	.2363 (101)	.0259 (101)	.0834 (103)	.0427 (105)	.0445 (105)	.1648 (105)	1348 (105)	2269 (105)	.2816 (105)	2907 (106)
8034 OV14	.2231 (100)	.2096 (100)	.1600 (100)	.1039 (100)	.1261 (102)	.0813 (104)	.0402 (104)	.0228 (104)	.0157 (104)	1197 (104)	.1794 (104)	2918 (105)
8035 OV15	.1435 (100)	2070 (100)	.2277 (100)	.1925 (100)	.1617 (102)	.0753 (104)	.0020 (104)	-.0005 (104)	-.0617 (104)	0870 (104)	.1797 (104)	.3610 (105)
8036 OV16	.1259 (100)	.2546 (100)	.1618 (100)	.0213 (100)	.0274 (102)	.0509 (104)	.0216 (104)	.0337 (104)	.0141 (104)	.2615 (104)	.2625 (104)	.2619 (105)
8037 OV17	.0866 (99)	.2427 (99)	.1612 (99)	.0814 (99)	.0790 (101)	.1576 (103)	.1408 (103)	.1545 (103)	.1500 (103)	.3617 (103)	.3186 (103)	.2830 (104)
8038 OV18	-.0229 (98)	.0887 (98)	.0298 (98)	.0771 (98)	.0720 (100)	.1660 (102)	.2066 (102)	.1933 (102)	.1334 (102)	3680 (102)	.1949 (102)	.2372 (103)
8039 OV19	-.0475 (99)	-.0839 (99)	-.0282 (99)	.0087 (99)	.0813 (101)	.0577 (103)	.0824 (103)	.1825 (103)	.1437 (103)	.2568 (103)	.2008 (103)	.1938 (104)
8040 OV20	-.0153 (99)	.0430 (99)	.0243 (99)	.1030 (99)	.1276 (101)	.1626 (103)	.1883 (103)	.1262 (103)	.0937 (103)	.2832 (103)	.3488 (103)	.1375 (104)
8041 OV21	0857 (99)	1536 (99)	.0121 (99)	.1362 (99)	.0935 (101)	.0423 (103)	.1794 (103)	.1421 (103)	.0088 (103)	.1968 (103)	.2637 (103)	.2794 (104)
8042 OV22	.1363 (98)	.0828 (98)	.1347 (98)	.0542 (98)	.0808 (100)	.0570 (102)	.0788 (102)	.0717 (102)	.0664 (102)	.2032 (102)	.3512 (102)	.3216 (103)
8043 OV23	.2300 (96)	.1942 (96)	.3050 (96)	.0853 (96)	.0623 (98)	.1178 (100)	.0805 (100)	.0682 (100)	.0687 (100)	.2478 (100)	.4038 (100)	.3397 (101)

8044.OV24	.2165 (89)	.1580 (89)	.2976 (89)	.0435 (89)	.0747 (91)	.1196 (93)	.0588 (93)	.0427 (93)	.1573 (93)	.3118 (93)	.4075 (93)	.3623 (94)
8045.OV25	.1515 (80)	.0843 (80)	.0495 (80)	-.0752 (80)	.0965 (82)	.1546 (84)	.1253 (84)	.0820 (84)	.0932 (84)	.3144 (84)	.3738 (84)	.3816 (85)
8046.OV26	.0786 (63)	.0874 (63)	.0354 (63)	-.2804 (63)	-.0617 (65)	.1200 (67)	.1513 (67)	.1255 (67)	.0582 (67)	.2149 (67)	.3498 (67)	.2805 (68)
8047.OV27	.2067 (51)	.2416 (51)	.1343 (51)	-.0931 (51)	.1524 (53)	.1366 (55)	.1457 (55)	.2917 (55)	.3411 (55)	.0853 (55)	.0883 (55)	-.0606 (56)
8048.OV28	.2037 (32)	.1112 (32)	.3400 (32)	-.1784 (32)	.1976 (34)	-.0374 (35)	-.1834 (35)	.2833 (35)	.3616 (35)	-.0182 (35)	.0504 (35)	-.1300 (36)
8049.OV29	.2526 (21)	.1626 (21)	.3289 (21)	-.2623 (21)	.2387 (23)	-.0111 (24)	-.1447 (24)	.3941 (24)	.4296 (24)	.1869 (24)	.2049 (24)	-.1483 (24)
	8014. OVM6	8015. OVM5	8016. OVM4	8017. OVM3	8018. OVM2	8019. OVM1	8020. OV0	8021. OV1	8022. OV2	8023. OV3	8024. OV4	8025. OV5
8026.OV6	1.0000											
8027.OV7	.6466 (109)	1.0000										
8028.OV8	.4268 (107)	.6419 (107)	1.0000									
8029.OV9	.3150 (107)	.5041 (107)	.7130 (107)	1.0000								
8030.OV10	.2166 (107)	.3887 (107)	.5778 (107)	.6663 (107)	1.0000							
8031.OV11	.1746 (107)	.3332 (107)	.4264 (107)	.5052 (107)	.6222 (107)	1.0000						
8032.OV12	.1890 (106)	.3160 (106)	.3397 (106)	.3641 (106)	.5004 (106)	.6789 (106)	1.0000					
8033.OV13	.3169 (106)	.4011 (106)	.3076 (105)	.3277 (105)	.4609 (105)	.4795 (105)	.7101 (105)	1.0000				
8034.OV14	.3100 (105)	.3766 (105)	.3647 (104)	.3600 (104)	.3619 (104)	.4118 (104)	.5437 (104)	.7012 (105)	1.0000			
8035.OV15	.3178 (105)	.3622 (105)	.4315 (104)	.4152 (104)	.4331 (104)	.3983 (104)	.4655 (104)	.5643 (105)	.7171 (105)	1.0000		
8036.OV16	.2571 (105)	.1849 (105)	.2818 (104)	.2348 (104)	.2520 (104)	.3638 (104)	.3142 (104)	.2883 (105)	.4653 (105)	.5988 (105)	1.0000	
8037.OV17	.3316 (104)	.1674 (104)	.2084 (103)	.1213 (103)	.2840 (103)	.3420 (103)	.2641 (103)	.2588 (104)	.3080 (104)	.4821 (104)	.7584 (104)	1.0000
8038.OV18	.3553 (103)	.2023 (103)	.2432 (102)	.1315 (102)	.2031 (102)	.2416 (102)	.2569 (102)	.2490 (103)	.2722 (103)	.3285 (103)	.6351 (103)	.7420 (103)

8039 OV19	.3195 (104)	.2202 (104)	.1726 (102)	.0830 (102)	.0944 (102)	.1748 (102)	.2196 (102)	.3167 (103)	.3140 (103)	.2118 (103)	.2780 (103)	.4452 (103)
8040 OV20	.3062 (104)	.2628 (104)	.2612 (102)	.2092 (102)	.1916 (102)	.1486 (102)	.0704 (102)	.1833 (103)	.1959 (103)	.2169 (103)	.2923 (103)	.4518 (103)
8041 OV21	.3384 (104)	.2785 (104)	.3836 (102)	.2822 (102)	.2500 (102)	.2799 (102)	.1932 (102)	.2672 (103)	.3384 (103)	.4032 (103)	.3135 (103)	.4264 (103)
8042 OV22	.2379 (103)	.2401 (103)	.3243 (101)	.3374 (101)	.3165 (101)	.2412 (101)	.2729 (101)	.2255 (102)	.3154 (102)	.3481 (102)	.2430 (102)	.2782 (102)
8043 OV23	.2870 (101)	.2712 (101)	.3145 (99)	.2032 (99)	.1961 (99)	.3967 (99)	.3894 (99)	.3692 (100)	.4424 (100)	.4451 (100)	.4215 (100)	.4410 (100)
8044 OV24	.2303 (94)	.1828 (94)	.2484 (92)	.2149 (92)	.3208 (92)	.2421 (92)	.4120 (92)	.3647 (93)	.3438 (93)	.3703 (93)	.3508 (93)	.4007 (93)
8045 OV25	.3270 (85)	.2972 (85)	.1991 (83)	.2700 (83)	.2768 (83)	.1945 (83)	.3659 (83)	.3894 (84)	.3298 (84)	.3013 (84)	.3546 (84)	.4476 (84)
8046 OV26	.2347 (68)	.1766 (68)	.1454 (67)	.1605 (67)	.3391 (67)	.2567 (67)	.4188 (67)	.3232 (68)	.2257 (68)	.1565 (68)	.3754 (68)	.2875 (68)
8047 OV27	-.0476 (56)	-.2012 (56)	-.1545 (55)	.0379 (55)	.2201 (55)	.2765 (55)	.1474 (55)	.1804 (56)	.0498 (56)	-.2620 (56)	.0664 (56)	-.0323 (56)
8048 OV28	-.1709 (36)	-.1810 (36)	-.1202 (35)	.1821 (35)	.3071 (35)	.4118 (35)	.4077 (35)	.4349 (36)	.0362 (36)	-.2560 (36)	-.2666 (36)	-.3832 (36)
8049 OV29	-.1748 (24)	-.2164 (24)	-.2340 (23)	.1728 (23)	.1359 (23)	.3715 (23)	.2458 (23)	.1907 (24)	-.2138 (24)	-.4278 (24)	-.2046 (24)	-.3790 (24)
	8026. OV6	8027. OV7	8028. OV8	8029. OV9	8030. OV10	8031. OV11	8032. OV12	8033. OV13	8034. OV14	8035. OV15	8036. OV16	8037. OV17
8038 OV18	1.0000											
8039 OV19	.6028 (103)	1.0000										
8040 OV20	.5391 (103)	.6604 (104)	1.0000									
8041 OV21	.5029 (103)	.5777 (104)	.7438 (104)	1.0000								
8042 OV22	.3501 (102)	.3711 (103)	.5533 (103)	.7488 (103)	1.0000							
8043 OV23	.2780 (100)	.2536 (101)	.4066 (101)	.5439 (101)	.6261 (101)	1.0000						
8044 OV24	.2897 (93)	.2449 (94)	.3682 (94)	.3694 (94)	.5251 (94)	.6356 (94)	1.0000					
8045 OV25	.3517 (84)	.3631 (85)	.3219 (85)	.3136 (85)	.4842 (85)	.4857 (85)	.7178 (85)	1.0000				

8046 OV26	.2728	.1040	.2200	.2045	.4006	.4133	.6394	.7031	1.0000			
	(68)	(68)	(68)	(68)	(68)	(68)	(68)	(68)				
8047.OV27	.1102	.1972	.1430	.0243	.0506	-.0398	.1500	.2354	.4462	1.0000		
	(56)	(56)	(56)	(56)	(56)	(56)	(56)	(56)	(56)			
8048.OV28	-.1396	.1630	-.1573	-.1587	-.0838	-.1992	.0748	-.0139	.3487	.7024	1.0000	
	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)	(36)		
8049.OV29	-.2626	.2449	.0239	-.0764	.0000	-.0921	.0484	.0623	.2663	.5433	.7630	1.0000
	(24)	(24)	(24)	(24)	(24)	(24)	(24)	(24)	(24)	(24)	(24)	
	8038. OV18	8039. OV19	8040. OV20	8041. OV21	8042. OV22	8043. OV23	8044. OV24	8045. OV25	8046. OV26	8047. OV27	8048. OV28	8049. OV29

```
READ INTERNAL FILE=NA.MIDAS VAR=190-195,1190-1195
MCORR OPTIONS=MATRIX VAR=ALL
READ INTERNAL FILE=NA.MIDAS VAR=196-201
DES
MCORR OPTIONS=MATRIX VAR=ALL
DES VAR=ALL
DEL VAR=ALL
READ INTERNAL FILE=NA.MIDAS VAR=5192-5232
MCORR OPTIONS=MATRIX VAR=ALL
DEL VAR=ALL
READ INTERNAL FILE=NA.MIDAS VAR=190-201,1190-1195
CODE CODE V1000=COUNT VAR=196-201 LABEL=WM1
HIST OPTIONS=NONEMPTY VAR=1000 INTERVAL=/1
MCORR OPTIONS=MATRIX VAR=ALL STRAT=V1000:(1-6)
DEL VAR=ALL
READ INTERNAL FILE=NA.MIDAS VAR=8002-8049
MCORR OPTIONS=MATRIX VAR=ALL STRAT=NONE


<FINISH COMPLETE>
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APPENDIX B

DATA IN SUPPORT OF ANALYSIS OF VELOCITY OVER UPGRADE ROLE

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<ANOVA VAR=9006-9008 STRAT=V9016>

Univariate 1-way ANOVA


ANALYSIS OF VARIANCE OF 9006.PU1%  N= 118 OUT OF 118

SOURCE              DF  SUM OF SQRS   MEAN SQR   F-STATISTIC  SIGNIF

BETWEEN              5     .47009 -3   .94019 -4   .75051       .5874
WITHIN             112     .14031 -1   .12527 -3
TOTAL              117     .14501 -1   (RANDOM EFFECTS STATISTICS)

ETA= .1801  ETA-SQR= .0324  (VAR COMP= -.16948 -5  %VAR AMONG= -0.)


PROP3VAR      N     MEAN      VARIANCE    STD DEV

(1)          37   .60673 -2   .10197 -3   .10098 -1
(2)          30   .87096 -2   .10546 -3   .10269 -1
(3)           5   .19415 -2   .79891 -5   .28265 -2
(4)          10   .48478 -2   .43528 -4   .65976 -2
(5)          19   .89896 -2   .28100 -3   .16763 -1
(6)          17   .97161 -2   .11372 -3   .10664 -1

GRAND       118   .74571 -2   .12394 -3   .11133 -1


Univariate 1-way ANOVA


ANALYSIS OF VARIANCE OF 9007.PU2%  N= 118 OUT OF 118

SOURCE              DF  SUM OF SQRS   MEAN SQR   F-STATISTIC  SIGNIF

BETWEEN              5     .39300 -3   .78600 -4   .57703       .7175
WITHIN             112     .15256 -1   .13621 -3
TOTAL              117     .15649 -1   (RANDOM EFFECTS STATISTICS)

ETA= .1585  ETA-SQR= .0251  (VAR COMP= -.31243 -5  %VAR AMONG= -0.)


PROP3VAR      N     MEAN      VARIANCE    STD DEV

(1)          37   .95885 -2   .12165 -3   .11029 -1
(2)          30   .94463 -2   .13541 -3   .11636 -1
(3)           5   .16511 -1   .11719 -3   .10826 -1
(4)          10   .57928 -2   .28360 -4   .53254 -2
(5)          19   .96838 -2   .14047 -3   .11852 -1
(6)          17   .10312 -1   .23108 -3   .15201 -1

GRAND       118   .96436 -2   .13375 -3   .11565 -1


Univariate 1-way ANOVA


ANALYSIS OF VARIANCE OF 9008.PUTOT%  N= 118 OUT OF 118

SOURCE              DF  SUM OF SQRS   MEAN SQR   F-STATISTIC  SIGNIF

BETWEEN              5     .72977 -3   .14595 -3   .40256       .8462
```

WITHIN	112	.40608 -1	.36257 -3
TOTAL	117	41338 -1	(RANDOM EFFECTS STATISTICS)

ETA= .1329 ETA-SQR= .0177 (VAR COMP= -.11747 -4 %VAR AMONG= -0.)

PROP3VAR	N	MEAN	VARIANCE	STD DEV
(1)	37	.15656 -1	.29304 -3	.17118 -1
(2)	30	.18156 -1	.28396 -3	.16851 -1
(3)	5	.18453 -1	.88781 -4	.94224 -2
(4)	10	.10641 -1	.10668 -3	.10329 -1
(5)	19	.18673 -1	.66418 -3	.25772 -1
(6)	17	.20028 -1	.53457 -3	.23121 -1
GRAND	118	.17101 -1	.35331 -3	.18797 -1

APPENDIX C

DATA SUPPORTING CRITICAL EVENTS ANALYSIS

APPENDIX C-1

Correlations Of Critical Events With Climate And Culture

CRITICAL EVENTS MEASURES

102 Months Since Change Of Command, Wave 1

103 Months Since Deployment, Wave 1

104 Months Deployed Since Last Survey, Wave 1

105 Months Since Overhaul, Wave 1

106 Months In Overhaul Since Last Survey, Wave 1

108 Months Since Change Of Command, Wave 2

109 Months Since Deployment, Wave 2

110 Months Deployed Since Last Survey, Wave 2

111 Months Since Overhaul, Wave 2

112 Months In Overhaul Since Last Survey, Wave 2

```
?mcorr v=108-110;506,190-195,1190-1195,196-201

 Missing Data Correlation

     VARIABLE          MEAN       STD DEV        N      CORR   T-STAT     SIGNIF

  108.V108          13.858      9.0936        120    .0377   .41036      .6823
  506.AVEVL         1.8895      .10263

  108.V108          14.846      9.6701        104   -.1170 -1.1896      .2370
  190.CLIMATE1      2.7884      .27028

  108.V108          14.846      9.6701        104   -.0238 -.24054      .8104
  191.SUPLEAD1      3.4302      .21291

  108.V108          14.846      9.6701        104    .0472   .47768      .6339
  192.WKGRP1        3.2699      .20097

  108.V108          14.024      9.1926        126   -.0208 -.23119      .8175
  193.CLIMATC1      .81771      .47265 -1

  108.V108          14.024      9.1926        126   -.0987 -1.1043      .2716
  194.SUPLEAC1      1.0402      .71775 -1

  108.V108          14.024      9.1926        126   -.1050 -1.1752      .2422
  195.WKGRPC1       .90725      .60437 -1

  108.V108          13.976      9.1716        127   -.1612 -1.8263      .0702
 1190.CLIMATE2      2.8167      .25923

  108.V108          13.976      9.1716        127   -.0961 -1.0800      .2822
 1191.SUPLEAD2      3.4439      .21831

  108.V108          13.976      9.1716        127   -.0140 -.15649      .8759
 1192.WKGRP2        3.2757      .20242

  108.V108          14.781      9.6466        105   -.1614 -1.6593      .1001
 1193.CLIMATC2      .82235      .58914 -1

  108.V108          14.781      9.6466        105   -.0026 -.26712 -1   .9787
 1194.SUPLEAC2      1.0392      .75700 -1

  108.V108          14.781      9.6466        105   -.2014 -2.0867      .0394
 1195.WKGRPC2       .90331      .68404 -1

  108.V108          12.653      9.3085         49   -.1007 -.69419      .4910
  196.CLIMM1        2.7112      .26315

  108.V108          13.317      9.7965         41   -.0678 -.42430      .6737
  197.SUPMM1        3.2754      .21108

  108.V108          12.653      9.3085         49    .0638   .43854      .6630
  198.PEEMM1        3.1754      .19182

  108.V108          12.653      9.3085         49   -.1823 -1.2711      .2100
  199.CLISM1        .83031      .72405 -1

  108.V108          13.317      9.7965         41   -.0336 -.21000      .8348
  200.SUPSM1        1.0224      .79124 -1

  108.V108          12.653      9.3085         49   -.1720 -1.1970      .2373
  201.PEESM1        .91382      .72407 -1
```

109.V109	10.580	9.2534	88	.2359	2.2509	.0269
506.AVEVL	1.8852	.88852 -1				
109.V109	10.785	9.5992	79	.1909	1.7065	.0919
190.CLIMATE1	2.7461	.24333				
109.V109	10.785	9.5992	79	.2406	2.1752	.0327
191.SUPLEAD1	3.3927	.20717				
109.V109	10.785	9.5992	79	.2031	1.8197	.0727
192.WKGRP1	3.2195	.18408				
109.V109	10.688	9.1497	93	.0572	.54647	.5861
193.CLIMATC1	.81512	.47255 -1				
109.V109	10.688	9.1497	93	-.0825	-.78949	.4319
194.SUPLEAC1	1.0445	.68701 -1				
109.V109	10.688	9.1497	93	-.0498	-.47580	.6354
195.WKGRPC1	.91016	.54466 -1				
109.V109	10.688	9.1497	93	.1172	1.1254	.2634
1190.CLIMATE2	2.7709	.25059				
109.V109	10.688	9.1497	93	.0889	.85109	.3970
1191.SUPLEAD2	3.4153	.22279				
109.V109	10.688	9.1497	93	.2702	2.6771	.0088
1192.WKGRP2	3.2467	.20444				
109.V109	10.785	9.5992	79	-.0914	-.80540	.4231
1193.CLIMATC2	.82155	.60672 -1				
109.V109	10.785	9.5992	79	-.0190	-.16640	.8683
1194.SUPLEAC2	1.0471	.77733 -1				
109.V109	10.785	9.5992	79	-.3476	-3.2529	.0017
1195.WKGRPC2	.91310	.69928 -1				
109.V109	10.237	8.7439	38	.1557	.94598	.3505
196.CLIMM1	2.7130	.24229				
109.V109	11.273	8.9137	33	.0516	.28765	.7755
197.SUPMM1	3.2662	.19827				
109.V109	10.237	8.7439	38	.1834	1.1194	.2704
198.PEEMM1	3.1654	.19050				
109.V109	10.237	8.7439	38	-.1463	-.88736	.3808
199.CLISM1	.82973	.70387 -1				
109.V109	11.273	8.9137	33	.0464	.25859	.7977
200.SUPSM1	1.0248	.75075 -1				
109.V109	10.237	8.7439	38	-.0541	-.32510	.7470
201.PEESM1	.91643	.67987 -1				
110.V110	5.6522	4.1495	92	-.1514	-1.4532	.1497
506.AVEVL	1.8893	.90174 -1				
110.V110	5.3704	4.0076	81	-.1254	-1.1238	.2643
190.CLIMATE1	2.7363	.24925				
110.V110	5.3704	4.0076	81	-.0581	-.51752	.6062
191.SUPLEAD1	3.3904	.20546				

110.V110	5.3704	4.0076	81	-.0439	-.39093	.6969
192.WKGRP1	3.2184	.18213				
110.V110	5.7526	4.2574	97	-.0263	-.25635	.7982
193.CLIMATC1	.81534	.48275 -1				
110.V110	5.7526	4.2574	97	.1034	1.0135	.3134
194.SUPLEAC1	1.0470	.69339 -1				
110.V110	5.7526	4.2574	97	.0164	.16003	.8732
195.WKGRPC1	.91329	.58703 -1				
110.V110	5.7526	4.2574	97	.0124	.12110	.9039
1190.CLIMATE2	2.7644	.25234				
110.V110	5.7526	4.2574	97	.0363	.35424	.7239
1191.SUPLEAD2	3.4143	.21850				
110.V110	5.7526	4.2574	97	-.0584	-.57048	.5697
1192.WKGRP2	3.2429	.20122				
110.V110	5.3704	4.0076	81	.1276	1.1431	.2565
1193.CLIMATC2	.82063	.61231 -1				
110.V110	5.3704	4.0076	81	.0644	.57375	.5678
1194.SUPLEAC2	1.0463	.77421 -1				
110.V110	5.3704	4.0076	81	.2218	2.0219	.0466
1195.WKGRPC2	.91202	.69827 -1				
110.V110	5.7179	3.9132	39	-.0369	-.22448	.8236
196.CLIMM1	2.7220	.24554				
110.V110	5.4545	3.8575	33	.1044	.58458	.5631
197.SUPMM1	3.2662	.19827				
110.V110	5.7179	3.9132	39	-.1412	-.86762	.3912
198.PEEMM1	3.1683	.18886				
110.V110	5.7179	3.9132	39	.0910	.55558	.5818
199.CLISM1	.83334	.73031 -1				
110.V110	5.4545	3.8575	33	-.1089	-.60969	.5464
200.SUPSM1	1.0248	.75075 -1				
110.V110	5.7179	3.9132	39	.0635	.38675	.7012
201.PEESM1	.91940	.69603 -1				

Command
?mcorr v=111-112;506,190-195,1190-1195,196-201

Missing Data Correlation

VARIABLE	MEAN	STD DEV	N	CORR	T-STAT	SIGNIF
111.V111	19.227	12.217	66	-.0789	-.63324	.5288
506.AVEVL	1.9029	.85378 -1				
111.V111	19.962	12.112	57	.1323	.98976	.3266
190.CLIMATE1	2.6907	.23323				

111.V111	19.982	12.112	57	.2924	2.2677	.0273
191.SUPLEAD1	3.3051	.17524				
111.V111	19.982	12.112	57	.3655	2.9117	.0052
192.WKGRP1	3.1670	.18729				
111.V111	18.548	12.243	73	-.2442	-2.1218	.0373
193.CLIMATC1	.80697	.51854 -1				
111.V111	18.548	12.243	73	-.2901	-2.5546	.0128
194.SUPLEAC1	1.0569	.67879 -1				
111.V111	18.548	12.243	73	-.3432	-3.0791	.0030
195.WKGRPC1	.92253	.65532 -1				
111.V111	18.548	12.243	73	.1142	.96857	.3360
1190.CLIMATE2	2.6969	.23770				
111.V111	18.548	12.243	73	.1262	1.0716	.2875
1191.SUPLEAD2	3.3166	.17364				
111.V111	18.548	12.243	73	.1227	1.0413	.3013
1192.WKGRP2	3.1676	.17448				
111.V111	19.982	12.112	57	-.2349	-1.7924	.0786
1193.CLIMATC2	.79970	.54441 -1				
111.V111	19.982	12.112	57	-.2888	-2.2367	.0294
1194.SUPLEAC2	1.0472	.76624 -1				
111.V111	19.982	12.112	57	-.2200	-1.6723	.1002
1195.WKGRPC2	.91074	.67148 -1				
111.V111	21.069	13.164	29	.2500	1.3414	.1910
196.CLIMM1	2.6064	.25384				
111.V111	21.560	13.445	25	.3832	1.9899	.0586
197.SUPMM1	3.1748	.18096				
111.V111	21.069	13.164	29	.3050	1.6643	.1076
198.PEEMM1	3.0922	.16525				
111.V111	21.069	13.164	29	.0117	.61048 -1	.9518
199.CLISM1	.81468	.63608 -1				
111.V111	21.560	13.445	25	-.4367	-2.3280	.0291
200.SUPSM1	1.0501	.69368 -1				
111.V111	21.069	13.164	29	-.4790	-2.8354	.0086
201.PEESM1	.93146	.58254 -1				
112.V112	3.0000	3.6289	66	.1094	.88087	.3817
506.AVEVL	1.9035	.85449 -1				
112.V112	2.5000	2.9573	58	.0380	.28492	.7763
190.CLIMATE1	2.6572	.23198				
112.V112	2.5000	2.9573	58	-.0379	-.28348	.7779
191.SUPLEAD1	3.3055	.17372				
112.V112	2.5000	2.9573	58	-.1382	-1.0443	.3008
192.WKGRP1	3.1679	.18577				
112.V112	3.2466	3.8325	73	.1505	1.2824	.2039
193.CLIMATC1	.80659	.52167 -1				

112.V112	3.2466	3.8325	73	.1588	1.3549	.1797
194.SUPLEAC1	1.0566	.67913 -1				
112.V112	3.2466	3.8325	73	.1172	.99478	.3232
195.WKGRPC1	.92169	.65541 -1				
112.V112	3.2466	3.8325	73	-.1905	-1.6352	.1064
1190.CLIMATE2	2.6980	.23820				
112.V112	3.2466	3.8325	73	-.0767	-.64856	.5187
1191.SUPLEAD2	3.3183	.17382				
112.V112	3.2466	3.8325	73	-.1065	-.90272	.3697
1192.WKGRP2	3.1680	.17459				
112.V112	2.5000	2.9573	58	.0174	.13001	.8970
1193.CLIMATC2	.80067	.54463 -1				
112.V112	2.5000	2.9573	58	.0762	.57204	.5696
1194.SUPLEAC2	1.0483	.76420 -1				
112.V112	2.5000	2.9573	58	.0566	.42442	.6729
1195.WKGRPC2	.91149	.66801 -1				
112.V112	3.7241	4.4231	29	-.3318	-1.8279	.0786
196.CLIMM1	2.6064	.25384				
112.V112	4.0800	4.6630	25	-.4079	-2.1425	.0430
197.SUPMM1	3.1748	.18096				
112.V112	3.7241	4.4231	29	-.4338	-2.5020	.0187
198.PEEMM1	3.0922	.16525				
112.V112	3.7241	4.4231	29	-.2674	-1.4422	.1607
199.CLISM1	.81468	.63608 -1				
112.V112	4.0800	4.6630	25	.3556	1.8248	.0810
200.SUPSM1	1.0501	.69368 -1				
112.V112	3.7241	4.4231	29	.2684	1.4476	.1592
201.PEESM1	.93146	.58254 -1				

Command

```
?mcorr v=102-106;506,190-195,1190-1195,196-201

Missing Data Correlation
```

VARIABLE	MEAN	STD DEV	N	CORR	T-STAT	SIGNIF
102.V102	13.129	7.4346	101	-.1225	-1.2277	.2225
506.AVEVL	1.8900	.10434				
102.V102	13.385	7.4837	104	-.1014	-1.0291	.3059
190.CLIMATE1	2.8005	.27201				
102.V102	13.385	7.4837	104	-.0369	-.37266	.7102
191.SUPLEAD1	3.4364	.21595				
102.V102	13.385	7.4837	104	.0339	.34244	.7327
192.WKGRP1	3.2737	.20340				
102.V102	13.385	7.4837	104	-.1787	-1.8340	.0696
193.CLIMATC1	.81963	.47515 -1				
102.V102	13.385	7.4837	104	.0017	.17408 -1	.9861
194.SUPLEAC1	1.0378	.75223 -1				
102.V102	13.385	7.4837	104	.0110	.11157	.9114
195.WKGRPC1	.90560	.63288 -1				
102.V102	13.352	7.4550	105	-.1982	-2.0523	.0427
1190.CLIMATE2	2.8232	.26308				
102.V102	13.352	7.4550	105	-.2422	-2.5339	.0128
1191.SUPLEAD2	3.4526	.23103				
102.V102	13.352	7.4550	105	-.1439	-1.4757	.1431
1192.WKGRP2	3.2843	.21365				
102.V102	13.352	7.4550	105	-.1990	-2.0609	.0418
1193.CLIMATC2	.82175	.58657 -1				
102.V102	13.352	7.4550	105	.0292	.29639	.7675
1194.SUPLEAC2	1.0380	.76218 -1				
102.V102	13.352	7.4550	105	-.0224	-.22713	.8208
1195.WKGRPC2	.90212	.68381 -1				
102.V102	13.625	7.5810	40	-.4669	-3.2548	.0024
196.CLIMM1	2.7485	.24255				
102.V102	13.364	7.5945	33	-.4755	-3.0092	.0052
197.SUPMM1	3.3230	.19543				
102.V102	13.625	7.5810	40	-.3203	-2.0841	.0439
198.PEEMM1	3.2132	.18524				
102.V102	13.625	7.5810	40	-.1405	-.87504	.3870
199.CLISM1	.83617	.69965 -1				
102.V102	13.364	7.5945	33	.0476	.26531	.7925
200.SUPSM1	1.0155	.77035 -1				
102.V102	13.625	7.5810	40	.0983	.60893	.5462
201.PEESM1	.90528	.76079 -1				

103.V103	11.753	9.8288	73	.1990	1.7106	.0915
506.AVEVL	1.8822	.89477 -1				
103.V103	11.870	9.6931	77	-.0675	-.58626	.5595
190.CLIMATE1	2.7570	.24009				
103.V103	11.870	9.6931	77	-.1240	-1.0821	.2827
191.SUPLEAD1	3.3919	.20793				
103.V103	11.870	9.6931	77	-.1399	-1.2239	.2248
192.WKGRP1	3.2165	.18484				
103.V103	11.870	9.6931	77	-.0928	-.80736	.4220
193.CLIMATC1	.81864	.48354 -1				
103.V103	11.870	9.6931	77	-.0435	-.37743	.7069
194.SUPLEAC1	1.0431	.69999 -1				
103.V103	11.870	9.6931	77	-.0083	-.72155 -1	.9427
195.WKGRPC1	.91061	.57028 -1				
103.V103	11.870	9.6931	77	-.0676	-.58692	.5590
1190.CLIMATE2	2.7813	.25171				
103.V103	11.870	9.6931	77	-.1507	-1.3206	.1906
1191.SUPLEAD2	3.4197	.23166				
103.V103	11.870	9.6931	77	-.0015	-.12922 -1	.9897
1192.WKGRP2	3.2483	.21156				
103.V103	11.870	9.6931	77	-.2460	-2.1982	.0310
1193.CLIMATC2	.82180	.61074 -1				
103.V103	11.870	9.6931	77	-.0352	-.30526	.7610
1194.SUPLEAC2	1.0473	.78171 -1				
103.V103	11.870	9.6931	77	-.1831	-1.6129	.1110
1195.WKGRPC2	.91172	.69738 -1				
103.V103	10.226	9.5209	31	.4481	2.6995	.0115
196.CLIMM1	2.7451	.24019				
103.V103	11.538	9.8559	26	.2851	1.4573	.1580
197.SUPMM1	3.3009	.18698				
103.V103	10.226	9.5209	31	.3347	1.9130	.0657
198.PREMM1	3.2053	.17933				
103.V103	10.226	9.5209	31	-.1347	-.79204	.4338
199.CLISM1	.83814	.71107 -1				
103.V103	11.538	9.8559	26	-.2059	-1.0306	.3129
200.SUPSM1	1.0246	.71245 -1				
103.V103	10.226	9.5209	31	-.0791	-.42751	.6720
201.PRESM1	.81218	.74087 -1				
104.V104	6.4762	5.1995	65	-.2849	-2.3583	.0214
506.AVEVL	1.8867	.90374 -1				
104.V104	6.6957	5.1998	69	.1941	1.6137	.1110
190.CLIMATE1	2.7278	.24940				

104.V104	6.6957	5.1998	69	.1619	1.3430	.1838
192.WKGRP1	3.2079	.18710				
104.V104	6.6957	5.1998	69	-.1062	-.87390	.3853
193.CLIMATC1	.81862	.44617 -1				
104.V104	6.6957	5.1998	69	.0125	.10201	.9191
194.SUPLEAC1	1.0507	.68015 -1				
104.V104	6.6957	5.1998	69	-.0545	-.44691	.6564
195.WKGRPC1	.91722	.61940 -1				
104.V104	6.6957	5.1998	69	.0858	.70483	.4834
1190.CLIMATE2	2.7704	.26664				
104.V104	6.6957	5.1998	69	.1209	.99712	.3223
1191.SUPLEAD2	3.4167	.24165				
104.V104	6.6957	5.1998	69	.0298	.24369	.8082
1192.WKGRP2	3.2382	.21697				
104.V104	6.6957	5.1998	69	.0989	.81373	.4167
1193.CLIMATC2	.81580	.54558 -1				
104.V104	6.6957	5.1998	69	.0564	.46275	.6450
1194.SUPLEAC2	1.0407	.78254 -1				
104.V104	6.6957	5.1998	69	.2614	2.2166	.0300
1195.WKGRPC2	.90848	.67899 -1				
104.V104	6.7097	4.7693	31	-.0270	-.14328	.8855
196.CLIMM1	2.7451	.24019				
104.V104	6.2692	4.8872	26	-.0541	-.26530	.7930
197.SUPMM1	3.3009	.18698				
104.V104	6.7097	4.7693	31	-.1240	-.67315	.5062
198.PEEMM1	3.2053	.17933				
104.V104	6.7097	4.7693	31	.1917	1.0517	.3016
199.CLISM1	.83814	.71107 -1				
104.V104	6.2692	4.8872	26	-.0295	-.14436	.8864
200.SUPSM1	1.0246	.74245 -1				
104.V104	6.7097	4.7693	31	.0778	.42047	.6778
201.PEESM1	.91218	.74087 -1				
105.V105	15.000	9.4372	50	-.0301	-.20833	.8354
306.AVEVL	1.8942	.83920 -1				
105.V105	15.037	9.7651	54	.0693	.50080	.6186
190.CLIMATE1	2.6642	.23415				
105.V105	15.037	9.7651	54	.1189	.86323	.3920
191.SUPLEAD1	3.3129	.17285				
105.V105	15.037	9.7651	54	.1737	1.2719	.2091
192.WKGRP1	3.1717	.19134				
105.V105	15.037	9.7651	54	-.0851	-.61581	.5407
193.CLIMATC1	.80207	.48324 -1				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	.71982 -1				

105.V105	15.037	9.7651	54	-.1273	-.92518	.3591
195.WKGRPC1	.91767	.68946 -1				
105.V105	15.037	9.7651	54	.1130	.81978	.4161
1190.CLIMATE2	2.6875	.21270				
105.V105	15.037	9.7651	54	.0851	.61555	.5409
1191.SUPLEAD2	3.3035	.18071				
105.V105	15.037	9.7651	54	.0187	.13518	.8930
1192.WKGRP2	3.1580	.17451				
105.V105	15.037	9.7651	54	-.1104	-.80075	.4269
1193.CLIMATC2	.79884	.52750 -1				
105.V105	15.037	9.7651	54	-.1459	-1.0638	.2923
1194.SUPLEAC2	1.0439	.77195 -1				
105.V105	15.037	9.7651	54	.0354	.25554	.7993
1195.WKGRPC2	.30849	.68034 -1				
105.V105	19.056	8.9276	18	.1351	.54553	.5929
196.CLIMM1	2.6161	.23131				
105.V105	19.750	9.0370	16	.0794	.29793	.7701
197.SUPMM1	3.2060	.17331				
105.V105	19.056	8.9276	18	.1542	.62425	.5413
198.PEEMM1	3.1229	.16888				
105.V105	19.056	8.9276	18	-.3664	-1.5749	.1346
199.CLISM1	.81616	.56704 -1				
105.V105	19.750	9.0370	16	-.2732	-1.0623	.3059
200.SUPSM1	1.0517	.64464 -1				
105.V105	19.056	8.9276	18	-.2656	-1.1018	.2869
201.PEESM1	.92081	.67296 -1				
106.V106	5.5714	4.8563	49	-.1561	-1.0836	.2841
506.AVEVL	1.8388	.82236 -1				
106.V106	5.7115	4.9043	52	-.0926	-.65725	.5140
190.CLIMATE1	2.6599	.23194				
106.V106	5.7115	4.9043	52	-.0159	-.11257	.9108
191.SUPLEAD1	3.2999	.17562				
106.V106	5.7115	4.9043	52	-.0014	-.95653 -2	.9924
192.WKGRP1	3.1636	.18778				
106.V106	5.7115	4.9043	52	.0045	.31702 -1	.9748
193.CLIMATC1	.80897	.49838 -1				
106.V106	5.7115	4.9043	52	.1825	1.3122	.1954
194.SUPLEAC1	1.0599	.64384 -1				
106.V106	5.7115	4.9043	52	.0859	.60936	.5450
195.WKGRPC1	.92642	.68500 -1				
106.V106	5.7115	4.9043	52	-.0171	-.12077	.9044
1190.CLIMATE2	2.6939	.23456				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

106.V106	5.7115	4.9043		52	.0489	.34654	.7304
1192.WKGRP2	3.1512	.17343					
106.V106	5.7115	4.9043		52	-.0417	-.29477	.7694
1193.CLIMATC2	.80168	.53756	-1				
106.V106	5.7115	4.9043		52	-.0098	-.69235	-1 .9451
1194.SUPLEAC2	1.0449	.79798	-1				
106.V106	5.7115	4.9043		52	-.0729	-.51661	.6077
1195.WKGRPC2	.91304	.67710	-1				
106.V106	4.5000	4.4426		20	-.3229	-1.4475	.1649
196.CLIMM1	2.6350	.23339					
106.V106	5.0000	4.6368		17	-.2713	-1.0919	.2921
197.SUPMM1	3.2164	.17322					
106.V106	4.5000	4.4426		20	-.1690	-.72734	.4764
198.PEEMM1	3.1241	.16441					
106.V106	4.5000	4.4426		20	-.1665	-.71650	.4829
199.CLISM1	.82035	.55168	-1				
106.V106	5.0000	4.6368		17	.0983	.38276	.7071
200.SUPSM1	1.0495	.63100	-1				

APPENDIX C-2

Correlation Of Critical Events
With Total Reenlistment And Overall Readiness

<MCORR>

Missing Data Correlation

VARIABLE	MEAN	STD DEV	N	CORR	T-STAT	SIGNIF
102 V102	13.175	7.4638	97	.0032	.31125 -1	.9752
5200.TT0	-.15693	.84060				
102 V102	12.656	6.7462	93	.0582	.55638	.5793
5201.TT1	-.28232	1.0078				
102 V102	12.941	7.1454	101	.2456	2.5211	.0133
5202.TT2	-.18605	.96287				
102 V102	13.245	7.3724	98	.2486	2.5143	.0136
5203.TT3	-.14190	.99272				
102 V102	13.182	7.4277	99	.2282	2.3082	.0231
5204.TT4	-.96803 -1	.88350				
102 V102	13.461	7.4882	102	.1994	2.0350	.0445
5205.TT5	-.58418 -1	.95835				
102 V102	13.375	7.4874	104	.0935	.94802	.3454
5206 TT6	.40805 -1	.95509				
102 V102	13.375	7.4874	104	.1152	1.1717	.2440
5207.TT7	-.36697 -1	.97344				
102 V102	13.375	7.4874	104	.1505	1.5376	.1272
5208.TT8	-.12317	.92221				
102 V102	13.417	7.5115	103	.1170	1.1841	.2392
5209.TT9	-.15061	.99066				
102 V102	13.375	7.4874	104	.1055	1.0711	.2866
5210 TT10	-.10603	.99239				
102 V102	13.375	7.4874	104	.1656	1.6955	.0930
5211 TT11	-.71836 -1	.95520				
102 V102	13.408	7.5166	103	.1132	1.1451	.2549
5212 TT12	-.40048 -1	1.0062				
102 V102	13.375	7.4874	104	.1205	1.2264	.2229
5213 TT13	-.70592 -2	.96272				
102 V102	13.417	7.5115	103	.1208	1.2234	.2240
5214 TT14	.54732 -1	1.0048				
102 V102	13.426	7.5648	101	.2059	2.0936	.0389
5215 TT15	-.75480 -1	.98812				
102 V102	13.390	7.6103	100	.1552	1.5556	.1230
5216 TT16	-.13388	1.0063				
102 V102	13.340	7.5154	103	.0762	.76790	.4443
5217 TT17	-.44968 -1	.96574				
102 V102	13.188	7.5056	101	.0235	.23417	.8153
5218 TT18	-.75347 -1	1.0131				

102 V102	13.081	7.3785	99	.2926	3.0142		.0033
5219 TT19	.10692	.84695					
102 V102	13.245	7.4905	102	.1878	1.9120		.0587
5220 TT20	-.13620	1.0390					
102 V102	13.070	7.4485	100	.1311	1.3093		.1935
5221 TT21	-.10750	.85028					
102 V102	13.129	7.4346	101	.0454	.45249		.6519
5222 TT22	-.21274	.83121					
102 V102	13.129	7.4346	101	.0201	.19969		.8421
5223 TT23	-.19209	.93043					
102 V102	13.129	7.4346	101	.0670	.66788		.5058
5224 TT24	-.18947	.96712					
102 V102	13.091	7.3943	99	-.0071	-.70140	-1	.9442
5225 TT25	-.16402	.97577					
102 V102	12.939	7.3842	99	.1362	1.3545		.1787
5226 TT26	-.12456	.98814					
102 V102	13.407	7.4072	91	.2416	2.3491		.0210
5227 TT27	-.11132	.80342					
102 V102	13.494	7.3458	83	.1915	1.7561		.0829
5228 TT28	-.72055	-1 .85866					
102 V102	13.768	7.4560	69	.0647	.53030		.5977
5229 TT29	-.51793	-1 .93570					
102 V102	12.944	7.5920	54	.2278	1.6868		.0976
5230 TT30	.11742	.78588					
102 V102	13.857	8.3741	35	.1466	.85106		.4009
5231 TT31	.17499	.84221					
102 V102	13.619	8.5993	21	.1056	.46294		.6487
5232 TT32	-.89574	-1 .88435					
103 V103	11.466	9.3795	73	-.0778	-.65733		.5131
5200 TT0	-.20018	.86636					
103 V103	11.548	9.4488	73	.0372	.31380		.7546
5201 TT1	-.28915	.90578					
103 V103	11.726	9.6541	73	.1404	1.1952		.2360
5202 TT2	-.30391	.93778					
103 V103	11.849	9.5984	73	.1584	1.3516		.1808
5203 TT3	-.23357	.89832					
103 V103	11.932	9.6081	73	.1473	1.2549		.2136
5204 TT4	-.12872	.90254					
103 V103	11.895	9.7551	76	.2057	1.8083		.0746
5205 TT5	-.87964	-1 .94096					

103 V103	11.895	9.7551	76	.2628	2.3433	.0218
5206 TT6	.93094 -2	.91762				
103.V103	11.895	9.7551	76	.2533	2.2525	.0273
5207.TT7	-.78676 -1	.90841				
103.V103	11.895	9.7551	76	.1606	1.3999	.1657
5208.TT8	-.16777	.83749				
103.V103	11.895	9.7551	76	.1968	1.7267	.0884
5209.TT9	-.17141	.92464				
103.V103	11.895	9.7551	76	.2186	1.9270	.0578
5210.TT10	-.17834	.96633				
103.V103	11.895	9.7551	76	.2539	2.2582	.0269
5211.TT11	-.16200	.92638				
103 V103	11.895	9.7551	76	.3691	3.4166	.0010
5212.TT12	-.88205 -1	.95617				
103 V103	11.895	9.7551	76	.2798	2.5067	.0144
5213 TT13	-.10614	.95298				
103 V103	11.895	9.7551	76	.2438	2.1625	.0338
5214.TT14	-.14623	1.0347				
103 V103	11.733	9.7181	75	.1593	1.3786	.1722
5215 TT15	-.15173	1.0076				
103 V103	11.733	9.7181	75	.2954	2.6419	.0101
5216 TT16	-.19197	1.0317				
103 V103	11.733	9.7181	75	.2196	1.9234	.0583
5217.TT17	-.16263	.97632				
103 V103	11.740	9.8235	73	.0863	.72957	.4681
5218.TT18	-.20021	1.0132				
103 V103	11.458	9.5666	72	-.0290	-.24288	.8088
5219.TT19	-.28319	.81780				
103 V103	11.797	9.7685	74	.0650	.55245	.5824
5220 TT20	-.34407	.99836				
103 V103	11.694	9.8847	72	.1923	1.6395	.1056
5221.TT21	-.19339	.86019				
103.V103	11.753	9.8288	73	.1976	1.6982	.0938
5222.TT22	-.29925	.88299				
103 V103	11.753	9.8288	73	.2261	1.9558	.0544
5223 TT23	-.31805	.97339				
103 V103	11.753	9.8288	73	.1657	1.4160	.1611
5224 TT24	-.27889	.92567				
103 V103	11.648	9.8866	71	.1950	1.6514	.1032
5225.TT25	-.26598	.76981				

103 V103	11.718	9.8491	71	.2197	1.8706	.0656
5226 TT26	12238	90223				
103 V103	11.815	9.8217	65	.1848	1.4924	.1406
5227 TT27	-.18977	.77291				
103 V103	12.190	9.8595	58	.2543	1.9681	.0540
5228 TT28	-.20113	.82780				
103 V103	12.958	10.204	48	.1398	.95745	.3433
5229 TT29	-.89109 -1	.97693				
103 V103	12.568	10.040	37	.3025	1.8779	.0687
5230 TT30	.29601 -1	.80192				
103 V103	11.080	8.4060	25	.3982	2.0818	.0487
5231 TT31	.98731 -2	.79269				
103 V103	10.611	7.9568	18	.2339	.96209	.3503
5232 TT32	-.19249	.83025				
104 V104	6.9219	5.2894	64	.0394	.31066	.7571
5200 TT0	-.25704	.89105				
104 V104	6.9231	5.2479	65	.0759	.60394	.5481
5201 TT1	-.29421	.91609				
104 V104	6.8308	5.2991	65	.0325	.25817	.7971
5202 TT2	-.37934	.88326				
104 V104	6.7424	5.3069	66	-.0172	-.13759	.8910
5203 TT3	-.23732	.86825				
104 V104	6.6818	5.2803	66	.0734	.58915	.5578
5204 TT4	-.15235	.87934				
104 V104	6.6324	5.2117	68	-.0419	-.34033	.7347
5205 TT5	-.75206 -1	.93828				
104 V104	6.6324	5.2117	68	-.0403	-.32766	.7442
5206 TT6	.22832 -1	.93078				
104 V104	6.6324	5.2117	68	.0653	-.53176	.5967
5207 TT7	-.13669	.90062				
104 V104	6.6324	5.2117	68	-.0814	-.66391	.5091
5208 TT8	.17911	.83418				
104 V104	6.6324	5.2117	68	-.2071	-1.7195	.0902
5209 TT9	-.17322	.94508				
104 V104	6.6324	5.2117	68	-.2000	-1.6581	.1021
5210 TT10	-.15781	.97712				
104 V104	6.6324	5.2117	68	-.2149	-1.7874	.0785
5211 TT11	-.15911	.93656				
104 V104	6.6324	5.2117	68	-.2300	-1.9196	.0592
5212 TT12	-.13395	1.0040				

104 V104	6.6324	5.2117	68	-.2137	-1.7767	.0802
5213 TT13	-.12089	.95036				
104 V104	6.6324	5.2117	68	-.1578	-1.2983	.1987
5214 TT14	-.18649	1.0451				
104 V104	6.7121	5.2441	66	-.0912	-.73275	.4664
5215 TT15	-.15151	1.0103				
104 V104	6.6269	5.2508	67	-.2819	-2.3691	.0208
5216 TT16	-.15849	1.0244				
104 V104	6.6269	5.2508	67	-.2931	-2.4716	.0161
5217 TT17	-.14173	.93162				
104 V104	6.6154	5.3318	65	-.0893	-.71140	.4795
5218 TT18	-.23079	1.0188				
104 V104	6.5625	5.1942	64	.0260	.20468	.8385
5219 TT19	-.28913	.84551				
104 V104	6.6212	5.2908	66	-.0789	-.63309	.5289
5220 TT20	-.34607	1.0678				
104 V104	6.4688	5.2402	64	-.1277	-1.0141	.3145
5221 TT21	-.19797	.87494				
104 V104	6.4769	5.1995	65	-.1185	-.94739	.3471
5222 TT22	-.31323	.90666				
104 V104	6.4769	5.1995	65	-.0541	-.43002	.6686
5223 TT23	-.33146	1.0139				
104 V104	6.4769	5.1995	65	.0293	.23254	.8169
5224 TT24	-.28101	.96043				
104 V104	6.5556	5.2357	63	-.0393	-.30690	.7600
5225 TT25	-.27402	.78631				
104 V104	6.5625	5.1942	64	.0364	.28659	.7754
5226 TT26	-.91264 -1	.88447				
104 V104	6.6379	5.0876	58	.0416	.31193	.7563
5227 TT27	-.18905	.74501				
104 V104	6.4038	4.7826	52	-.1338	-.95463	.3444
5228 TT28	-.18505	.83849				
104 V104	6.2727	4.8482	44	-.1311	-.85682	.3964
5229 TT29	-.76657 -1	.88718				
104 V104	5.9091	4.6055	33	-.1017	-.56917	.5733
5230 TT30	-.92113 -3	.82988				
104 V104	6.6667	4.5534	21	-.1260	-.55375	.5862
5231 TT31	-.66305 -2	.78746				
104 V104	7.1429	5.2456	14	-.3857	1.4482	.1732
5232 TT32	-.29427	.79834				

105 V105	15 438	10 108	48	1215	84642	4106
5200 TT0	32182	87732				
105 V105	14 545	9 7562	44	1516	99410	3259
5201 TT1	- 41707	88926				
105 V105	15 360	9 9443	50	1273	88923	3783
5202 TT2	- 19473	1 0908				
105 V105	15 083	9 9185	48	1241	84826	4007
5203 TT3	- 12071	1 0403				
105 V105	14 980	9 8343	50	0182	12608	9002
5204 TT4	- 17664	96268				
105 V105	14 392	9 6480	51	- 0032	- 22402 -1	9822
5205 TT5	- 11318	1 1291				
105 V105	14 830	9 7384	53	- 0533	- 38088	7049
5206 TT6	97396 -1	1 0810				
105 V105	14 830	9 7384	53	0507	36280	7183
5207 TT7	36641 -1	1 0948				
105 V105	14 830	9 7384	53	0419	29921	7660
5208 TT8	62536 -2	1 0564				
105 V105	14 830	9 7384	53	0436	31167	7566
5209 TT9	- 20523 -1	1 1679				
105 V105	14 830	9 7384	53	0392	28023	7804
5210 TT10	37149 -1	1 1060				
105 V105	14 830	9 7384	53	1014	72764	4702
5211 TT11	83237 -1	1 0397				
105 V105	14 830	9 7384	53	0283	20241	8404
5212 TT12	29987 -1	1 1102				
105 V105	14 830	9 7384	53	- 1021	- 73299	4669
5213 TT13	40336 -1	1 0797				
105 V105	14 830	9 7384	53	- 0486	- 34760	7296
5214 TT14	- 70943 -1	1 1552				
105 V105	15 137	9 7509	51	0400	28052	7803
5215 TT15	- 78489 -1	1 1821				
105 V105	14 960	9 7895	50	0899	62522	5348
5216 TT16	- 11769	1 1160				
105 V105	15 077	9 6647	52	2131	1 5424	1293
5217 TT17	- 63984 -1	1 0142				
105 V105	14 880	9 5525	50	2533	1 8137	0760
5218 TT18	- 18830	1 0772				
105 V105	14 796	9 4229	49	1528	1 0603	2944
5219 TT19	- 73779 -1	94283				

105.V105	14.765	9.4023	51	-.0100	-.28023	.7805
5220.TT20	-.31970	1.1483				
105.V105	15.122	9.4918	49	-.2523	-1.7876	.0803
5221.TT21	-.28665	.92013				
105.V105	15.000	9.4372	50	-.0612	-.42455	.6731
5222.TT22	-.45035	.83515				
105.V105	15.000	9.4372	50	-.0123	-.85209 -1	.9325
5223.TT23	-.43395	.98481				
105.V105	15.000	9.4372	50	.0879	.61148	.5438
5224.TT24	-.30394	.99994				
105.V105	14.979	9.6083	48	.2331	1.6258	.1108
5225.TT25	-.28887	.77168				
105.V105	15.061	9.5250	49	.0271	.18596	.8533
5226.TT26	-.14598	.97383				
105.V105	15.089	9.7020	45	.1513	1.0035	.3212
5227.TT27	-.73667 -1	.89408				
105.V105	13.975	9.5555	40	.3643	2.4118	.0208
5228.TT28	-.31687 -1	.91007				
105.V105	14.091	9.6254	33	.4055	2.4699	.0192
5229.TT29	.68815 -2	.96094				
105.V105	15.423	10.120	26	.4386	2.3909	.0250
5230.TT30	.16658	.90073				
105.V105	15.278	11.039	18	.5037	2.3321	.0331
5231.TT31	.23652	.98193				
105.V105	13.846	10.785	13	.5337	2.0930	.0603
5232.TT32	-.58513 -1	.97297				
106.V106	5.5870	4.7683	46	-.1459	-.97852	.3332
5200.TT0	-.39458	.86400				
106.V106	6.0233	4.7081	43	-.0975	-.62713	.5340
5201.TT1	-.48937	.85663				
106.V106	5.6667	4.7371	48	-.1337	-.91510	.3649
5202.TT2	-.29192	1.0381				
106.V106	5.6522	4.7245	46	.0857	.57049	.5712
5203.TT3	-.23059	1.0205				
106.V106	5.4694	4.6686	49	.0280	.19228	.8483
5204.TT4	-.21754	.92298				
106.V106	5.7000	4.9000	50	.0280	.19404	.8470
5205.TT5	-.11854	1.1104				
106.V106	5.7115	4.9043	52	.0441	.31181	.7565
5206.TT6	.80596 -1	1.0837				

106 V106	5.7115		4.9043	52	-.1137		.80930	.4222
5207 TT7	.21770	2	1.0897					
106 V106	5.7115		4.9043	52	-.1159		-.82478	.4134
5208 TT8	.62563	-1	1.0434					
106 V106	5.7115		4.9043	52	-.1120		-.79728	.4291
5209 TT9	-.77298	-1	1.1508					
106 V106	5.7115		4.9043	52	-.0877		-.62221	.5366
5210 TT10	-.21721	-1	1.0992					
106 V106	5.7115		4.9043	52	-.1697		-1.2176	.2291
5211 TT11	.20391	-1	1.0491					
106 V106	5.7115		4.9043	52	-.0591		-.41857	.6773
5212 TT12	-.37356	-1	1.1504					
106 V106	5.7115		4.9043	52	.0038		.27139	-1 .9785
5213 TT13	-.26856	-1	1.1115					
106 V106	5.7115		4.9043	52	.0012		.83128	-2 .9934
5214 TT14	-.14345		1.1812					
106 V106	5.6600		4.9595	50	.0229		.15885	.8745
5215 TT15	-.10903		1.1684					
106 V106	5.6122		4.9109	49	-.0344		-.23597	.8145
5216 TT16	-.15999		1.1221					
106 V106	5.6275		4.9151	51	-.1771		-1.2594	.2138
5217 TT17	-.11638		1.0105					
106 V106	5.7143		4.9707	49	-.3048		-2.1943	.0332
5218 TT18	-.25046		1.1130					
106 V106	5.6667		4.8612	48	-.1130		-.77121	.4445
5219 TT19	-.14663		.96816					
106 V106	5.7200		4.9199	50	.0766		.53204	.5972
5220 TT20	-.34976		1.1547					
106 V106	5.5625		4.9073	48	.0573		.38940	.6988
5221 TT21	-.32588		.91366					
106 V106	5.5714		4.8563	49	-.1154		-.79618	.4299
5222 TT22	-.43768		.85624					
106 V106	5.5714		4.8563	49	.0249		.17106	.8649
5223 TT23	-.43459		1.0104					
106 V106	5.5714		4.8563	49	.1059		.73035	.4688
5224 TT24	-.31570		1.0426					
106 V106	5.6809		4.9260	47	-.0422		-.28304	.7784
5225 TT25	-.34371		.77016					
106 V106	5.6042		4.9022	48	.1497		1.0271	.3097
5226 TT26	-.21257		.95322					

106.V106	5.6977	5.0073	43	-.0193	-.12386	.9020
5227.TT27	-.10523	.84603				
106.V106	5.7949	5.0793	39	-.1291	-.79220	.4333
5228.TT28	-.68049 -2	.90633				
106.V106	5.2813	4.8342	32	-.4501	-2.7611	.0097
5229.TT29	.42002 -1	.97143				
106.V106	4.1200	4.3428	25	-.2156	-1.0587	.3007
5230.TT30	.15608	.91567				
106.V106	4.2500	4.5680	16	-.1901	-.72439	.4808
5231.TT31	.25718	.96426				
106.V106	4.1818	3.3710	11	-.6178	-2.3568	.0428
5232.TT32	-.57645 -1	.93915				
108.V108	14.686	9.5281	96	.0999	.97346	.3328
5200.TT0	-.12670	.87042				
108.V108	14.172	9.3572	93	.1699	1.6444	.1035
5201.TT1	-.27009	1.0634				
108.V108	14.690	9.5534	100	.1043	1.0378	.3019
5202.TT2	-.21072	.95827				
108.V108	14.643	9.5542	98	.3258	3.3769	.0011
5203.TT3	-.16008	.98773				
108.V108	14.434	9.5385	99	.1821	1.8237	.0713
5204.TT4	-.12474	.89632				
108.V108	14.539	9.6613	102	.1461	1.4769	.1428
5205.TT5	-.45906 -1	.96773				
108.V108	14.654	9.6046	104	.1174	1.1936	.2354
5206.TT6	.49543 -1	.96383				
108.V108	14.654	9.6046	104	.1670	1.7104	.0902
5207.TT7	-.16236 -1	.96962				
108.V108	14.654	9.6046	104	.2228	2.3080	.0230
5208.TT8	-.10615	.92158				
108.V108	14.524	9.5598	103	.1775	1.8125	.0729
5209.TT9	-.12403	.99408				
108.V108	14.654	9.6046	104	.1387	1.4148	.1602
5210.TT10	-.79990 -1	1.0017				
108.V108	14.654	9.6046	104	.1969	2.0286	.0451
5211.TT11	-.50491 -1	.96067				
108.V108	14.709	9.6351	103	.1002	1.0125	.3137
5212.TT12	-.21019 -1	1.0157				
108.V108	14.654	9.6046	104	.1683	1.7243	.0877
5213.TT13	-.32749 -2	.96188				

108 V108	14 524	9 5598	103	.1585	1.6133	.1098
5214 TT14	- 51953 -1	1.0116				
108 V108	14 455	9 5755	101	.2497	2 5655	.0118
5215 TT15	- 81299 -1	98941				
108 V108	14 630	9 6239	100	.2368	2 4132	0177
5216 TT16	- .12699	1.0082				
108 V108	14 699	9 6404	103	.2245	2.3149	.0226
5217 TT17	- 28031 -1	.97020				
108 V108	14 802	9 6644	101	.0868	86686	.3881
5218 TT18	- .71582 -1	1.0147				
108 V108	14 293	9.5129	99	.1086	1.0761	.2845
5219 TT19	- .10816	.85332				
108 V108	14 686	9 6872	102	.1553	1.5724	.1190
5220 TT20	- 15355	1.0301				
108 V108	14 630	9 5565	100	.0894	.88841	.3765
5221 TT21	- 14457	.83687				
108 V108	14 515	9.5787	101	.1221	1.2243	.2237
5222 TT22	- .22830	82363				
108 V108	14 515	9.5787	101	.2221	2.2670	.0256
5223 TT23	- 22058	.92790				
108 V108	14 515	9.5787	101	.3254	3.4240	.0009
5224 TT24	- .20674	.95216				
108 V108	14 667	9.5980	99	.2963	3.0553	.0029
5225 TT25	- .15452	.95492				
108 V108	14 384	9 5241	99	.1391	1.3838	.1696
5226 TT26	- .11544	.98879				
108 V108	14 418	9 6368	91	.1901	1 8263	.0712
5227 TT27	- 66604 -1	82613				
108 V108	14 506	9 4319	83	.2434	2 2590	.0266
5228 TT28	- 55671 -1	.87506				
108 V108	15 221	9 6566	68	.2332	1 9482	.0556
5229 TT29	- 58093 -1	.94983				
108 V108	15 407	9 7584	54	.2337	1 7331	.0890
5230 TT30	.11846	.78057				
108 V108	16 111	10 136	36	.0251	14634	.8845
5231 TT31	15547	83531				
108 V108	14 304	8 5729	23	.3419	1.6675	.1103
5232 TT32	- 72234 -1	.88718				
109 V109	10 189	9 0956	74	.2681	2.3616	.0209
5200 TTO	- 14590	.90973				

109.V109	10.480	9.2010	75	.3654	3.3538	.0013
5201.TT1	-.27916	.97298				
109.V109	10.622	9.2643	74	.2649	2.3310	.0226
5202.TT2	-.32700	.93623				
109.V109	10.293	9.2412	75	.3371	3.0595	.0031
5203.TT3	-.25501	.86556				
109.V109	10.573	9.4557	75	.2881	2.5704	.0122
5204.TT4	-.16557	.90394				
109.V109	10.833	9.6516	78	.3907	3.7004	.0004
5205.TT5	-.91448 -1	.93968				
109.V109	10.833	9.6516	78	.3706	3.4788	.0008
5206.TT6	.17976 -1	.92094				
109.V109	10.833	9.6516	78	.3983	3.7853	.0003
5207.TT7	-.52154 -1	.91079				
109.V109	10.833	9.6516	78	.3157	2.9001	.0049
5208.TT8	-.14549	.84338				
109.V109	10.833	9.6516	78	.3443	3.1971	.0020
5209.TT9	-.14231	.92964				
109.V109	10.833	9.6516	78	.2447	2.1999	.0309
5210.TT10	-.15140	.97221				
109.V109	10.833	9.6516	78	.2989	2.7303	.0079
5211.TT11	-.13872	.92752				
109.V109	10.833	9.6516	78	.3103	2.8453	.0057
5212.TT12	-.68622 -1	.96249				
109.V109	10.833	9.6516	78	.2766	2.5092	.0142
5213.TT13	-.92638 -1	.95664				
109.V109	10.833	9.6516	78	.3412	3.1647	.0022
5214.TT14	-.13846	1.0320				
109.V109	10.831	9.7149	77	.3036	2.7592	.0073
5215.TT15	-.15211	.99886				
109.V109	10.831	9.7149	77	.3550	3.2888	.0015
5216.TT16	-.18950	1.0254				
109.V109	10.831	9.7149	77	.3231	2.9562	.0042
5217.TT17	-.14264	.97261				
109.V109	10.467	9.5611	75	.2703	2.3988	.0190
5218.TT18	-.16349	.98025				
109.V109	10.473	9.4190	74	.0110	.92961 -1	.9262
5219.TT19	-.27302	.81899				
109.V109	10.697	9.7078	76	.1267	1.0985	.2755
5220.TT20	-.33769	.99058				

109 V109	10.554	9.5961	74	.4355	4.1052	.0001
5221 TT21	-.21261	.85400				
109 V109	10.787	9.7417	75	.3010	2.6966	.0087
5222 TT22	-.29242	.87809				
109 V109	10.787	9.7417	75	.3900	3.6191	.0005
5223 TT23	-.33524	.96549				
109 V109	10.787	9.7417	75	.3529	3.2227	.0019
5224 TT24	-.28793	.91432				
109 V109	10.904	9.8463	73	.4465	4.2051	.0001
5225 TT25	-.27307	.76256				
109 V109	10.836	9.8489	73	.3220	2.8654	.0055
5226 TT26	-.11393	.90127				
109 V109	11.179	10.071	67	.2329	1.9307	.0579
5227 TT27	-.12773	.80638				
109 V109	11.550	10.382	60	.2406	1.8879	.0640
5228 TT28	-.13996	.84809				
109 V109	12.878	10.570	49	.2181	1.5324	.1321
5229 TT29	-.57934 -1	.89346				
109 V109	13.051	10.359	39	.3897	2.5737	.0142
5230 TT30	.63846 -1	.79742				
109 V109	12.778	9.5649	27	.0598	.29958	.7670
5231 TT31	.33593 -1	.79823				
109 V109	11.900	8.8550	20	.0712	.30283	.7655
5232 TT32	-.16226	.84246				
110 V110	5.5000	3.8827	74	-.1556	-1.3369	.1855
5200 TT0	-.14590	.90973				
110 V110	5.4342	3.9203	76	-.3061	-2.7661	.0072
5201 TT1	-.25459	.98992				
110 V110	5.3553	3.9487	76	-.2430	-2.1545	.0345
5202 TT2	-.31553	.92753				
110 V110	5.4286	3.8948	77	-.2699	-2.4273	.0176
5203 TT3	-.25149	.86029				
110 V110	5.3247	3.9049	77	-.2062	-1.8252	.0720
5204 TT4	-.17941	.89673				
110 V110	5.3250	4.0119	80	-.2600	-2.3778	.0199
5205 TT5	-.12161	.94803				
110 V110	5.3250	4.0119	80	-.2739	-2.5152	.0140
5206 TT6	-.39384 -2	.92318				
110 V110	5.3250	4.0119	80	-.2783	-2.5592	.0124
5207 TT7	-.70214 -1	.90765				

110.V110	5.3250	4.0119	80	-.2866	-2.6421	.0100
5208.TT8	-.13171	.84907				
110.V110	5.3250	4.0119	80	-.2224	-2.0147	.0474
5209.TT9	-.12570	.93463				
110.V110	5.3250	4.0119	80	-.2121	-1.9168	.0589
5210.TT10	-.13027	.97882				
110.V110	5.3250	4.0119	80	-.2414	-2.1968	.0310
5211.TT11	-.12947	.92202				
110.V110	5.3250	4.0119	80	-.1282	-1.1419	.2570
5212.TT12	-.10339	.98428				
110.V110	5.3250	4.0119	80	-.1020	-.90531	.3681
5213.TT13	-.92421 -1	.94880				
110.V110	5.3250	4.0119	80	-.1195	-1.0631	.2910
5214.TT14	-.13117	1.0213				
110.V110	5.3462	4.0221	78	-.0698	-.60981	.5438
5215.TT15	-.15868	.99405				
110.V110	5.2911	4.0260	79	-.1315	-1.1643	.2479
5216.TT16	-.18379	1.0183				
110.V110	5.2911	4.0260	79	-.1740	-1.5501	.1252
5217.TT17	-.14355	.96392				
110.V110	5.4026	4.0173	77	-.1195	-1.0422	.3007
5218.TT18	-.16493	.96756				
110.V110	5.4342	4.0343	76	-.0083	-.71781 -1	.9430
5219.TT19	-.26780	.82219				
110.V110	5.3462	4.0221	78	-.0689	-.60225	.5488
5220.TT20	-.31637	1.0071				
110.V110	5.4342	4.0343	76	-.2648	-2.3620	.0208
5221.TT21	-.22152	.84500				
110.V110	5.3766	4.0394	77	-.1793	-1.5781	.1187
5222.TT22	-.29439	.86782				
110.V110	5.3766	4.0394	77	-.3062	-2.7859	.0068
5223.TT23	-.32899	.95466				
110.V110	5.3766	4.0394	77	-.2507	-2.2429	.0279
5224.TT24	-.27979	.90377				
110.V110	5.3600	4.0923	75	-.3338	-3.0253	.0034
5225.TT25	-.25161	.76489				
110.V110	5.4267	4.0609	75	-.2705	-2.4008	.0189
5226.TT26	-.94968 -1	.90010				
110.V110	5.4265	3.9297	68	-.1487	-1.2212	.2263
5227.TT27	-.13565	.80300				

110.V110	5.6557	3.9660	61	-.2645	-2.1070	.0394
5228.TT28	-.13961	.84099				
110.V110	5.4400	4.0565	50	-.2683	-1.9296	.0596
5229.TT29	-.64145 -1	.88539				
110.V110	5.3250	4.0407	40	-.4053	-2.7329	.0095
5230.TT30	.68429 -1	.78767				
110.V110	5.1786	4.1101	28	-.1130	-.58010	.5668
5231.TT31	.32571 -1	.78332				
110.V110	4.7619	3.4483	21	-.2264	-1.0130	.3238
5232.TT32	-.14681	.82417				
111.V111	20.020	12.356	50	.0215	.14915	.8821
5200.TT0	-.32082	.87064				
111.V111	18.468	11.645	47	.1785	1.2170	.2299
5201.TT1	-.39987	.91770				
111.V111	19.604	12.438	53	.1965	1.4311	.1585
5202.TT2	-.18545	1.0764				
111.V111	19.059	12.222	51	.3466	2.5863	.0127
5203.TT3	-.13924	1.0248				
111.V111	19.340	12.188	53	.1973	1.4374	.1567
5204.TT4	-.15232	.94853				
111.V111	19.056	11.748	54	.3346	2.5608	.0134
5205.TT5	-.11579	1.1251				
111.V111	19.732	12.072	56	.2549	1.9369	.0580
5206.TT6	.10961	1.0639				
111.V111	19.732	12.072	56	.2472	1.8750	.0662
5207.TT7	.48880 -1	1.0834				
111.V111	19.732	12.072	56	.2363	1.7868	.0796
5208.TT8	-.16431 -1	1.0397				
111.V111	19.732	12.072	56	.1670	1.2446	.2187
5209.TT9	-.36937 -1	1.1484				
111.V111	19.732	12.072	56	.1761	1.3147	.1942
5210.TT10	.27354 -1	1.0899				
111.V111	19.732	12.072	56	.2650	2.0195	.0484
5211.TT11	.59351 -1	1.0302				
111.V111	19.732	12.072	56	.2610	1.9870	.0520
5212.TT12	.31402 -2	1.1330				
111.V111	19.732	12.072	56	.1725	1.2868	.2037
5213.TT13	.13850 -1	1.1090				
111.V111	19.732	12.072	56	.1778	1.3274	.1900
5214.TT14	-.79425 -1	1.1761				

111.V111	20.037	12.077	54	.1859	1.3645	.1783
5215.TT15	-.71724 -1	1.1745				
111.V111	19.377	12.199	53	.1684	1.2202	.2280
5216.TT16	-.13744	1.1419				
111.V111	19.727	12.183	55	.2141	1.5954	.1166
5217.TT17	-.78191 -1	1.0402				
111.V111	19.868	12.266	53	.3663	2.8116	.0070
5218.TT18	-.18462	1.1040				
111.V111	19.750	12.063	52	.3622	2.7473	.0083
5219.TT19	-.12804	.95051				
111.V111	19.963	12.170	54	.1005	.72843	.4696
5220.TT20	-.31396	1.1293				
111.V111	20.019	12.336	5.	-.2389	-1.7396	.0881
5221.TT21	-.29364	.91534				
111.V111	20.113	12.236	53	-.1123	-.80716	.4233
5222.TT22	-.43039	.83196				
111.V111	20.113	12.236	53	-.0955	-.68486	.4965
5223.TT23	-.40825	.98292				
111.V111	20.113	12.236	53	-.0230	-.16401	.8704
5224.TT24	-.29241	1.0107				
111.V111	19.980	12.368	51	.1698	1.2061	.2336
5225.TT25	-.28641	.77416				
111.V111	20.192	12.342	52	.1517	1.0855	.2829
5226.TT26	-.15404	96045				
111.V111	20.809	12.193	47	.2220	1.5276	.1336
5227.TT27	-.83530 -1	.87893				
111.V111	20.238	12.103	42	.3414	2.2975	.0269
5228.TT28	-.11623 -1	.89926				
111.V111	20.743	12.094	35	.3588	2.2080	.0343
5229.TT29	.28389 -1	.95104				
111.V111	21.714	12.549	28	.3657	2.0038	.0556
5230.TT30	.19590	.87799				
111.V111	22.105	13.262	19	.5104	2.4469	.0256
5231.TT31	.22433	.95865				
111.V111	18.643	12.762	14	.2875	1.0399	.3189
5232.TT32	-.42755 -1	.93666				
112.V112	2.5400	3.0587	50	2142	1.5191	1353
5200.TT0	-.32082	.87064				
112.V112	2.7292	3.1605	48	1078	.73540	.4658
5201.TT1	-.33950	.99958				

112	V112	2.6111		3.0370	54	.0420	.30280	.7632
5202	TT2	-.19979		1.0714				
112	V112	2.6731		3.0788	52	-.1217	-.86706	.3901
5203	TT3	-.13556		1.0150				
112	V112	2.6111		3.0370	54	-.1610	-1.1762	.2449
5204	TT4	-.14702		.94035				
112	V112	2.5818		3.0166	55	-.2258	-1.6876	.0974
5205	TT5	-.10985		1.1155				
112	V112	2.5263		2.9767	57	-.1868	-1.4105	.1640
5206	TT6	.10317		1.0554				
112	V112	2.5263		2.9767	57	-.1404	-1.0520	.2974
5207	TT7	.49363	-1	1.0737				
112	V112	2.5263		2.9767	57	-.1292	-.96632	.3381
5208	TT8	-.12678	-1	1.0307				
112	V112	2.5263		2.9767	57	-.0278	-.20623	.8374
5209	TT9	-.31358	-1	1.1388				
112	V112	2.5263		2.9767	57	-.0730	-.54295	.5894
5210	TT10	.15051	-1	1.0841				
112	V112	2.5263		2.9767	57	-.1162	-.86750	.3894
5211	TT11	.47672	-1	1.0248				
112	V112	2.5263		2.9767	57	-.0843	-.62776	.5328
5212	TT12	-.86079	-2	1.1263				
112	V112	2.5263		2.9767	57	-.0854	-.63536	.5278
5213	TT13	.41716	-2	1.1015				
112	V112	2.5263		2.9767	57	-.0824	-.61314	.5423
5214	TT14	-.96508	-1	1.1727				
112	V112	2.5091		3.0054	55	-.0437	-.31876	.7512
5215	TT15	-.79870	-1	1.1652				
112	V112	2.6111		3.0370	54	-.0056	-.40118	-1 .9682
5216	TT16	-.14645		1.1330				
112	V112	2.5536		2.9965	56	-.0310	-.22773	.8207
5217	TT17	-.79362	-1	1.0308				
112	V112	2.4630		2.9120	54	-.2428	-1.8052	.0768
5218	TT18	-.18760		1.0938				
112	V112	2.4906		2.9327	53	-.2537	-1.8732	.0668
5219	TT19	-.12987		.94142				
112	V112	2.4364		2.8916	55	-.1132	-.82919	.4107
5220	TT20	-.31177		1.1189				
112	V112	2.4906		2.9327	53	.2532	1.8690	.0674
5221	TT21	-.28815		.90737				

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 112.V112          2.4630     2.9120       54     1068    .77460      .4421
5222.TT22         -.41151     .83568

 112.V112          2.4630     2.9120       54     1096    .79497      .4302
5223.TT23         -.40619     .97372

 112.V112          2.4630     2.9120       54     .1274    92602      .3587
5224.TT24         -.29484     1.0013

 112.V112          2.5192     2.9538       52    -.0022   -.15402 -1   .9878
5225.TT25         -.29793     .77102

 112.V112          2.4906     2.9327       53     .0243    .17393      .8626
5226.TT26         -.15009     .95160

 112.V112          2.5208     3.0387       48    -.0376   -.25517      .7997
5227.TT27         -.67775 -1  .87635

 112.V112          2.5349     3.0655       43    -.0860   - 55248     .5836
5228.TT28         -.20033 -2  .89073

 112.V112          2.6111     3.2801       36    -.1272   -.74750     .4599
5229.TT29          .19389 -1  .94186

 112.V112          2.7241     3.3795       29    -.2122   -1.1284     .2691
5230.TT30          .20323     .86307

 112.V112          2.8500     3.5582       20    -.2135   -.92701     .3662
5231.TT31          .18938     .94608

 112.V112          3.4667     3.9437       15     .0729    .26357      .7962
5232.TT32         -.92249 -1  .92272


<DEL VAR=5200-5232>


<READ INTERNAL FILE=NA.MIDAS VAR=8020-8049>


Read Observations
FROM INTERNAL FILE "NA.MIDAS"
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<MCORR VAR=102-106,108-112;8020-8049>

Missing Data Correlation

	VARIABLE	MEAN	STD DEV	N	CORR	T-STAT	SIGNIF
102	V102	12.793	6.8429	92	.0900	.85756	.3934
8020	OV0	-.13817	.90131				
102	V102	12.793	6.8429	92	.0647	.61477	.5403
8021	OV1	-.66446 -1	.92577				
102	V102	12.793	6.8429	92	-.0826	-.78591	.4340
8022	OV2	-.75043 -1	.91550				
102	V102	12.793	6.8429	92	.0943	.89851	.3713
8023	OV3	-.15809	.89300				
102	V102	12.793	6.8429	92	-.0076	-.72174 -1	.9426
8024	OV4	-.55631 -2	1.0176				
102	V102	12.849	6.8270	93	-.0045	-.43135 -1	.9657
8025	OV5	.48228 -1	.94069				
102	V102	12.849	6.8270	93	-.1561	-1.5074	.1352
8026	OV6	.11354	.93158				
102	V102	12.849	6.8270	93	-.1117	-1.0721	.2865
8027	OV7	-.33929 -1	.98256				
102	V102	12.692	6.7374	91	.0280	.26459	.7919
8028	OV8	.58788 -1	.90046				
102	V102	12.692	6.7374	91	-.1599	-1.5283	.1300
8029	OV9	-.47929 -2	.94136				
102	V102	12.692	6.7374	91	-.0864	-.81797	.4156
8030	OV10	-.10876	.93337				
102	V102	12.692	6.7374	91	.0156	.14694	.8835
8031	OV11	-.95946 -2	.97448				
102	V102	12.692	6.7374	91	.0126	.11889	.9056
8032	OV12	.10303	.97031				
102	V102	12.802	6.8883	91	-.0583	-.55060	.5833
8033	OV13	.34378 -1	.98799				
102	V102	12.667	6.8038	90	-.0188	-.17657	.8603
8034	OV14	-.77680 -1	1.0078				
102	V102	12.667	6.8038	90	.0860	.80977	.4203
8035	OV15	.29437 -1	1.0108				
102	V102	12.667	6.8038	90	.1896	1.8114	.0735
8036	OV16	.44454 -1	1.0457				
102	V102	12.667	6.8038	90	.1541	1.4632	.1470
8037	OV17	.41659 -1	1.0724				
102	V102	12.551	6.7521	89	.0497	.46401	.6438
8038	OV18	-.34199 -1	.95091				

102 V102	12.556	6.7112	90	.1924	1.8390	.0693
8039 0V19	.10144	1.0524				
102 V102	12.556	6.7112	90	.2030	1.9450	.0550
8040 0V20	.53626 -1	1.0263				
102 V102	12.556	6.7112	90	.1271	1.2022	.2325
8041 0V21	.99437 -1	.93839				
102 V102	12.427	6.6399	89	.1291	1.2147	.2278
8042 0V22	.57378 -1	1.0094				
102 V102	12.330	6.6137	88	.0746	.69352	.4899
8043 0V23	.14972	.98317				
102 V102	12.765	6.5751	81	-.0451	-.40083	.6896
8041 0V24	.75858 -1	1.0208				
102 V102	12.795	6.4030	73	-.1889	-1.6208	.1095
8045 0V25	-.40295 -1	.93395				
102 V102	12.638	5.9226	58	-.0174	-.12986	.8971
8046 0V26	-.83331 -2	.91632				
102 V102	11.891	5.8660	46	-.2000	-1.3543	.1826
8047 0V27	.64072 -1	.90765				
102 V102	12.433	6.3228	30	-.0114	-.60405 -1	.9523
8048 0V28	-.85046 -1	.74254				
102 V102	12.500	7.0231	18	.0260	.10420	.9183
8049 0V29	-.31590	1.0948				
103 V103	10.563	8.6284	71	.2862	2.4811	.0155
8020 0V0	-.90409 -1	.88634				
103 V103	10.563	8.6284	71	.1938	1.6411	.1053
8021 0V1	-.21865 -1	.91409				
103 V103	10.563	8.6284	71	-.1547	-1.3003	.1978
8022 0V2	-.94915 -1	.91911				
103 V103	10.563	8.6284	71	-.0847	-.70638	.4823
8023 0V3	-.20457	.85642				
103 V103	10.563	8.6284	71	.0069	.56977 -1	.9547
8024 0V4	-.72718 -1	1.0048				
103 V103	10.563	8.6284	71	-.0495	-.41197	.6816
8025 0V5	-.22636 -1	.89655				
103 V103	10.563	8.6284	71	-.1112	-.92906	.3561
8026 0V6	.33685 -1	.84625				
103 V103	10.563	8.6284	71	-.0046	-.37908 -1	.9699
8027 0V7	-.15004	.89329				
103 V103	10.563	8.6284	71	-.0606	-.50463	.6154
8028 0V8	-.14347 -2	.81311				

103 V103	10.563	8.6284	71	-.0061	.50928 -1	.9595
8029 0V9	-.11925	.87561				
103 V103	10.563	8.6284	71	.0659	.54827	.5853
8030 0V10	-.23297	.84071				
103 V103	10.563	8.6284	71	.1676	1.4124	.1623
8031 0V11	-.12977	.93448				
103 V103	10.563	8.6284	71	.1502	1.2619	.2112
8032 0V12	-.13428 -1	.92669				
103 V103	10.371	8.5367	70	.1975	1.6616	.1012
8033 0V13	-.83509 -1	.96271				
103 V103	10.304	8.5806	69	.2736	2.3285	.0229
8034 0V14	-.19182	.97855				
103 V103	10.304	8.5806	69	.2230	1.8727	.0655
8035 0V15	-.12257	.95052				
103 V103	10.304	8.5806	69	.0902	.74148	.4610
8036 0V16	-.22293 -2	1.0133				
103 V103	10.304	8.5806	69	.1044	.85932	.3932
8037 0V17	-.28918 -1	1.0135				
103 V103	10.353	8.6348	68	.0397	.32287	.7478
8038 0V18	-.15114	.85005				
103 V103	10.353	8.6348	68	.1213	.99317	.3243
8039 0V19	-.58609 -1	.97070				
103 V103	10.353	8.6348	68	.0299	.24266	.8090
8040 0V20	-.90802 -1	.91924				
103 V103	10.353	8.6348	68	.1151	.94099	.3501
8041 0V21	-.43803 -1	.85847				
103 V103	10.179	8.5793	67	-.0339	-.27333	.7855
8042 0V22	-.95226 -1	.95747				
103 V103	10.273	8.6105	66	.2016	1.6468	.1045
8043 0V23	.11421	.95633				
103 V103	10.233	8.4460	60	.0175	.13336	.8944
8044 0V24	.51872 -2	.99064				
103 V103	10.434	8.3586	53	-.0706	-.50512	.6157
8045 0V25	-.18742	.82536				
103 V103	10.884	8.5974	43	-.1737	-1.1291	.2654
8046 0V26	-.20045	.82496				
103 V103	10.559	8.1768	34	-.1809	-1.0406	.3059
8047 0V27	.48569 -2	.89073				
103 V103	9.7917	6.7178	24	-.1577	-.74908	.4617
8048 0V28	-.10040	.81259				

103 V103		9.5294		6.7000	17	-.1486	.58186	.5693
8049 0V29		.25904		1.1008				
104 V104		6.9063		5.2242	64	-.0286	-.22508	.8227
8020 0V0		.12504		.93073				
104 V104		6.9063		5.2242	64	.1228	.97451	.3336
8021 0V1		-.30025	-1	.94053				
104 V104		6.9063		5.2242	64	.1630	1.3012	.1980
8022 0V2		-.53422	1	.94286				
104 V104		6.9063		5.2242	64	.0632	.49883	.6197
8023 0V3		-.14981		.88179				
104 V104		6.9063		5.2242	64	-.1026	-.81255	.4196
8024 0V4		-.64351	-2	1.0579				
104 V104		6.9063		5.2242	64	-.2310	-1.8691	.0663
8025 0V5		.24748	-1	.91517				
104 V104		6.9063		5.2242	64	-.1626	-1.2977	.1992
8026 0V6		.77280	-1	.85817				
104 V104		6.9063		5.2242	64	.0253	.19916	.8428
8027 0V7		-.11708		.91543				
104 V104		6.9063		5.2242	64	.0257	.20263	.8401
8028 0V8		-.18787	-1	.78202				
104 V104		6.9063		5.2242	64	-.0126	-.99598 -1	.9210
8029 0V9		-.66238	-1	.90178				
104 V104		6.9063		5.2242	64	.0179	.14109	.8883
8030 0V10		-.19147		.86371				
104 V104		6.9063		5.2242	64	.1342	1.0666	.2903
8031 0V11		-.78007	-1	.93201				
104 V104		6.9063		5.2242	64	.1183	.93790	.3519
8032 0V12		.54637	-1	.93097				
104 V104		6.9048		5.2662	63	-.0043	-.33453 -1	.9734
8033 0V13		.16142	-1	.95849				
104 V104		6.7581		5.1778	62	-.2082	-1.6492	.1043
8034 0V14		-.13959		.98647				
104 V104		6.7581		5.1778	62	-.1139	-.88768	.3783
8035 0V15		-.96904	-1	.92101				
104 V104		6.7581		5.1778	62	-.0697	-.54092	.5906
8036 0V16		.34685	-1	1.0415				
104 V104		6.7581		5.1778	62	-.0723	-.56119	.5768
8037 0V17		-.21462	-1	1.0319				
104 V104		6.7541		5.2207	61	-.1053	-.81350	.4192
8038 0V18		-.11250		.85376				

104 V104	6 7541	5 2207	61	2141	1 6835	0976
8039 0V19	35948 -1	1 0213				
104 V104	6 7541	5 2207	61	0169	12948	8974
8040 0V20	17334 -1	98656				
104 V104	6 7541	5 2207	61	-.1633	-1 2716	2085
8041 0V21	21530 -1	81863				
104 V104	6 8500	5 2102	60	-.0518	39502	6943
8042 0V22	-.65439 -1	91752				
104 V104	6 8500	5 2102	60	-.0743	56738	5726
8043 0V23	10219	90268				
104 V104	6 9630	5 0915	54	-.0967	70061	4867
8044 0V24	38491 -1	1 0327				
104 V104	6 7500	4 7781	48	0111	75064 -1	9405
8045 0V25	-.18175	85949				
104 V104	6 6750	4 8590	40	1749	1 0953	2803
8046 0V26	-.17641	85112				
104 V104	6 2581	4 5751	31	2382	1 3205	1970
8047 0V27	62146 -1	89127				
104 V104	6 7143	4 5513	21	3411	1 5817	1302
8048 0V28	-.76152 -1	85616				
104 V104	7 1429	5 2456	14	0754	26181	7979
8049 0V29	-.14781	1 1775				
105 V105	14 170	9 3374	47	-.4616	-3.4906	0011
8020 0V0	-.23781 -1	1.0657				
105 V105	14 170	9 3374	47	-.2327	-1.6047	1155
8021 0V1	81900 -1	1.0864				
105 V105	14 170	9 3374	47	0203	13617	8923
8022 0V2	-.10621	96613				
105 V105	14 170	9.3374	47	1236	83538	4079
8023 0V3	-.16701	97597				
105 V105	14 170	9.3374	47	2517	1.7447	0879
8024 0V4	97414 -1	1.1325				
105 V105	14 170	9 3374	47	1319	89244	3769
8025 0V5	-.15101 -1	99793				
105 V105	14 170	9 3374	47	1073	72404	4728
8026 0V6	-.57282 -1	98277				
105 V105	14 170	9 3374	47	1496	1 0153	3154
8027 0V7	-.28519	1.0004				
105 V105	14 170	9.3374	47	0581	39039	6981
8028 0V8	-.14200	91230				

105.V105	14.170		9.3374	47	.1118		.75505	.4542
8029.0V9	-.24348		1.0006					
105.V105	14.170		9.3374	47	.0704		.47326	.6383
8030.0V10	-.20860		1.0009					
105.V105	14.170		9.3374	47	.1767		1.2046	.2347
8031.0V11	-.61903	-1	1.0745					
105.V105	14.170		9.3374	47	-.0446		-.29969	.7658
8032.0V12	.99351	-2	1.0825					
105.V105	14.435		9.2608	46	-.0053		-.34877	-1 .9723
8033.0V13	.20723	-1	1.1240					
105.V105	14.689		9.2018	45	-.1100		-.72590	.4718
8034.0V14	-.15453		1.0754					
105.V105	14.689		9.2018	45	-.1618		-1.0754	.2882
8035.0V15	.59802	-1	1.1044					
105.V105	14.689		9.2018	45	-.1301		-.86039	.3943
8036.0V16	.24452		1.1318					
105.V105	14.689		9.2018	45	-.0050		-.32918	-1 .9739
8037.0V17	.27031		1.1243					
105.V105	14.318		8.9619	44	-.2329		-1.5521	.1281
8038.0V18	.31952	-1	.97330					
105.V105	14.318		8.9619	44	.1500		.98325	.3311
8039.0V19	.25517		1.1121					
105.V105	14.318		8.9619	44	-.0268		-.17367	.8630
8040.0V20	.22139		1.0811					
105.V105	14.318		8.9619	44	-.0957		-.62299	.5367
8041.0V21	.13750		.98379					
105.V105	14.372		9.0607	43	-.1108		-.71394	.4793
8042.0V22	.77984	-1	1.0377					
105.V105	14.372		9.0607	43	.1000		.64360	.5234
8043.0V23	.27134		1.0922					
105.V105	14.333		9.2262	39	-.0502		-.30579	.7615
8044.0V24	.13052		1.1203					
105.V105	12.912		8.8159	34	-.1240		-.70710	.4846
8045.0V25	-.16528		.93709					
105.V105	12.538		8.7829	26	-.0465		-.22801	.8216
8046.0V26	.21221	-1	.98157					
105.V105	13.810		9.1685	21	-.1098		-.48147	.6357
8047.0V27	.99146	-1	.97787					
105.V105	13.500		9.9518	14	-.0457		-.15831	.8768
8048.0V28	.40731	-1	1.0083					

105 V105	12.100		9.6891	10	.1061	.30176		.7705
8049.0V29	.79120	-1	1.3246					
106 V106	5.8723		4.6840	47	.3299	2.3439		.0236
8020.0V0	-.36978	-1	1.0478					
106 V106	5.8723		4.6840	47	.3163	2.2364		.0303
8021 0V1	.39187	-1	1.0694					
106 V106	5.8723		4.6840	47	.0550	.36935		.7136
8022.0V2	-.11000		.96922					
106.V106	5.8723		4.6840	47	-.0049	-.32890	-1	.9739
8023.0V3	-.17048		.97818					
106 V106	5.8723		4.6840	47	-.1026	-.69192		.4925
8024.0V4	.67590	-1	1.1555					
106 V106	5.8723		4.6840	47	-.2199	-1.5048		.1394
8025 0V5	.36642	-1	1.0100					
106 V106	5.8723		4.6840	47	-.1975	-1.3516		.1833
8026.0V6	.41152	-3	.99503					
106.V106	5.8723		4.6840	47	-.2816	-1.9690		.0551
8027.0V7	-.23262		1.0298					
106.V106	5.8723		4.6840	47	-.0505	-.33904		.7362
8028.0V8	-.16060		.86624					
106.V106	5.8723		4.6840	47	-.0444	-.29846		.7667
8029.0V9	-.18771		.99342					
106.V106	5.8723		4.6840	47	.0088	.59334	-1	.9529
8030.0V10	-.16898		1.0324					
106.V106	5.8723		4.6840	47	.0153	.10268		.9187
8031.0V11	-.29671	-2	1.0727					
106 V106	5.8723		4.6840	47	.2258	1.5546		.1270
8032.0V12	.12044	-1	1.0678					
106 V106	5.7826		4.6947	46	.0661	.43911		.6627
8033.0V13	.24660	-1	1.1097					
106 V106	5.6222		4.6186	45	.0903	.59474		.5551
8034 0V14	-.19084		1.0789					
106 V106	5.6222		4.6186	45	.2041	1.3672		.1787
8035 0V15	.26033	-2	1.0942					
106 V106	5.6222		4.6186	45	.1946	1.3007		.2003
8036.0V16	.20929		1.1688					
106 V106	5.6222		4.6186	45	.1924	1.2856		.2055
8037 0V17	.27720		1.1080					
106 V106	5.7273		4.6173	44	.2178	1.4466		.1554
8038 0V18	.17524	-1	.98072					

106.V106	5.7273	4.6173	44	-.0061	.39612	-1	.9686
8039.0V19	.23809	1.1229					
106.V106	5.7273	4.6173	44	.1022	.66574		.5092
8040.0V20	.20299	1.1045					
106.V106	5.7273	4.6173	44	.0669	.43149		.6662
8041.0V21	.79730 -1	.95806					
106.V106	5.7674	4.6641	43	.0165	.10560		.9164
8042.0V22	.19872 -1	1.0023					
106.V106	5.7674	4.6641	43	.0201	.12849		.8984
8043.0V23	.21420	1.0698					
106.V106	5.8947	4.7522	38	.0230	.13823		.8908
8044.0V24	.10740	1.1548					
106.V106	6.0294	4.8021	34	-.1066	-.60656		.5484
8045.0V25	-.18877	.93737					
106.V106	5.5769	4.5004	26	-.0697	-.34228		.7351
8046.0V26	-.10224 -1	1.0123					
106.V106	4.1905	3.5443	21	.0821	.35919		.7234
8047.0V27	.17493	.91894					
106.V106	4.1538	3.1845	13	.1666	.56027		.5865
8048.0V28	.85194 -1	1.0351					
106.V106	4.8889	3.3333	9	.1516	.40566		.6971
8049.0V29	.23040	1.3102					
108.V108	13.413	8.9506	92	-.0719	-.68355		.4960
8020.0V0	-.13133	.92617					
108.V108	13.413	8.9506	92	.1186	1.1328		.2603
8021.0V1	-.16006 -1	.95397					
108.V108	13.413	8.9506	92	.1257	1.2022		.2325
8022.0V2	-.41311 -1	.93517					
108.V108	13.413	8.9506	92	.0762	.72478		.4705
8023.0V3	-.17179	.87744					
108.V108	13.413	8.9506	92	-.0361	-.34226		.7330
8024.0V4	-.10699 -1	1.0263					
108.V108	13.591	9.0665	93	.1280	1.2314		.2213
8025.0V5	.17811 -1	.93371					
108.V108	13.591	9.0665	93	-.0929	-.88992		.3759
8026.0V6	.75371 -1	.94316					
108.V108	13.591	9.0665	93	-.0803	-.76858		.4441
8027.0V7	-.51331 -1	.97365					
108.V108	13.659	9.1545	91	.0996	.94467		.3474
8028.0V8	.31662 -1	.89531					

108.V108	13.659		9.1545	91	.1060		1.0054	.3174
8029.0V9	-.62854	-1	.94574					
108.V108	13.659		9.1545	91	.0256		.24153	.8097
8030.0V10	-.14863		.92174					
108.V108	13.659		9.1545	91	.0060		.56874 -1	.9548
8031.0V11	-.30359	-1	.97897					
108.V108	13.659		9.1545	91	.0789		.74686	.4571
8032.0V12	.73448	-1	.96582					
108.V108	13.670		9.1507	91	.0478		.45159	.6527
8033.0V13	-.15433	-1	.97671					
108.V108	13.467		8.9921	90	-.0303		-.28461	.7766
8034.0V14	-.13383		.99561					
108.V108	13.467		8.9921	90	.0046		.43226 -1	.9656
8035.0V15	-.17460	-1	1.0046					
108.V108	13.467		8.9921	90	.0585		.54989	.5838
8036.0V16	.35221	-1	1.0578					
108.V108	13.467		8.9921	90	.0536		.50353	.6158
8037.0V17	.19013	-1	1.0838					
108.V108	13.438		9.0390	89	-.0262		-.24440	.8075
8038.0V18	-.46686	-1	.95154					
108.V108	13.400		8.9954	90	-.0158		-.14866	.8822
8039.0V19	.11751		1.0632					
108.V108	13.400		8.9954	90	-.0976		-.92002	.3601
8040.0V20	.25976	-1	1.0175					
108.V108	13.400		8.9954	90	.0124		.11600	.9079
8041.0V21	.44123	-1	.93884					
108.V108	13.427		9.0427	89	.0077		.71455 -1	.9432
8042.0V22	.10422	-1	1.0087					
108.V108	13.227		8.8950	88	.0258		.23978	.8111
8043.0V23	.11190		.97153					
108.V108	13.099		8.9199	81	.0716		.63846	.5250
8044.0V24	.16987	-1	1.0289					
108.V108	13.055		8.5860	73	.0166		.13980	.8892
8045.0V25	-.74397	-1	.91738					
108.V108	13.684		8.7631	57	-.0245		-.18195	.8563
8046.0V26	-.37167	-1	.91934					
108.V108	13.304		8.8264	46	-.0507		-.33672	.7379
8047.0V27	.14520		.96568					
108.V108	13.968		9.1633	31	.1307		.71004	.4833
8048.0V28	-.20999	-1	.81024					

108.V108	12.550	7.2291	20	.2843	1.2579	.2245
8049.0V29	-.22345	1.1353				
109.V109	9.4384	8.2848	73	.2326	2.0154	.0476
8020.0V0	-.81145 -1	.91069				
109.V109	9.4384	8.2848	73	.2450	2.1295	.0367
8021.0V1	.53203 -1	.92453				
109.V109	9.4384	8.2848	73	.3445	3.0920	.0028
8022.0V2	-.31187 -1	.92990				
109.V109	9.4384	8.2848	73	.2547	2.2193	.0297
8023.0V3	- 18768	.84386				
109.V109	9.4384	8.2848	73	.1658	1.4165	.1610
8024.0V4	-.42341 -1	1.0143				
109.V109	9.4384	8.2848	73	-.1098	-.93116	.3549
8025.0V5	-.53220 -1	.88721				
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8026.0V6	.32693 -2	.86506				
109.V109	9.4384	8.2848	73	.0351	.29594	.7681
8027.0V7	-.17400	.89105				
109.V109	9.4384	8.2848	73	.0928	.78572	.4346
8028.0V8	-.30650 -1	.80977				
109.V109	9.4384	8.2848	73	.1530	1.3042	.1964
8029.0V9	-.17231	.88235				
109.V109	9.4384	8.2848	73	.2421	2.1023	.0391
8030.0V10	-.24706	.83768				
109.V109	9.4384	8.2848	73	.0024	.20076 -1	.9840
8031.0V11	-.11082	.94393				
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8032.0V12	-.73913 -2	.91902				
109.V109	9.4167	8.3409	72	.0297	.24897	.8041
8033.0V13	-.88440 -1	.95102				
109.V109	9.4930	8.3749	71	-.0391	-.32508	.7461
8034.0V14	-.19080	.95585				
109.V109	9.4930	8.3749	71	-.1288	-1.0787	.2845
8035.0V15	-.13482	.94509				
109 V109	9.4930	8.3749	71	-.3008	-2.6199	.0108
8036.0V16	.68208 -2	1.0368				
109.V109	9.4930	8.3749	71	-.1859	-1.5713	.1207
8037.0V17	- 87980 -2	1.0222				
109 V109	9.3286	8.3192	70	-.2248	-1.9024	.0614
8038.0V18	-.12344	.86845				

109 V109	9.3286		8.3192	70	-.1245	-1.0343		.3046
8039.0V19	.56059	-2	.99990					
109 V109	9.3286		8.3192	70	-.1167	-.96896		.3360
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8041.0V21	-.84600	-1	.86615					
109 V109	9.3913		8.3635	69	.1743	1.4487		.1521
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8048.0V28	-.10725	-1	.87133					
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8020.0V0	-.85244	-1	.93831					
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8021.0V1	.46778	-1	.95286					
110 V110	5.6133		3.9793	75	-.2759	-2.4530		.0166
8022.0V2	-.91514	-3	.93853					
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8023.0V3	-.15345		.86155					
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110 V110	5.6133		3.9793	75	.1535	1.3272		.1886
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110.V110	5.6133		3.9793	75	-.0306	-.26120		.7947
8026.0V6	.32487	-1	.87457					
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8027.0V7	-.13948		.90616					
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110.V110	5.6133	3.9793	75	.0266	.22711	.8210
8029.0V9	-.16174	.90176				
110.V110	5.6133	3.9793	75	-.0409	-.34952	.7277
8030.0V10	-.27089	.83912				
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8032.0V12	.13893 -2	.92980				
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8033.0V13	-.88643 -1	.93825				
110.V110	5.6164	4.0126	73	.1176	.99813	.3216
8034.0V14	-.20904	.94931				
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8036.0V16	-.16640 -1	1.0324				
110.V110	5.6164	4.0126	73	.1749	1.4970	.1388
8037.0V17	.37217 -2	1.0259				
110.V110	5.6806	4.0029	72	.1368	1.1552	.2519
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110.V110	5.6806	4.0029	72	-.0035	-.29407 -1	.9766
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8040.0V20	-.40430 -1	.94289				
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8041.0V21	-.65792 -1	.86388				
110.V110	5.6761	4.0312	71	-.2051	-1.7403	.0863
8042.0V22	-.11379	.94994				
110.V110	5.7429	4.0205	70	-.1119	-.92842	.3565
8043.0V23	.10817	.94325				
110.V110	5.7778	3.8707	63	-.0964	-.75636	.4523
8044.0V24	-.23267 -1	.98685				
110.V110	6.0714	3.8747	56	.0402	.29547	.7688
8045.0V25	-.16633	.80873				
110.V110	5.9333	3.9795	45	.0692	.45492	.6515
8046.0V26	-.21363	.84455				
110.V110	5.6757	4.0004	37	-.0644	-.38153	.7051
8047.0V27	.10329	.94049				
110.V110	5.3333	4.1044	27	-.0979	-.49188	.6271
8048.0V28	-.30228 -1	.86040				

110 V110	4.3500	3.4255	20	.0466	.19780	.8454
8049 0V29	-.18563	1.1105				
111 V111	18.220	11.356	50	-.3204	-2.3432	.0233
8020 0V0	.79071 -2	1.0594				
111 V111	18.220	11.356	50	-.2114	-1.4984	.1406
8021 0V1	.75237 -1	1.0862				
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8022 0V2	-.10325	.97916				
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8023 0V3	-.16236	.99051				
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8024 0V4	.50339 -1	1.1250				
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8025 0V5	.15961 -1	1.0107				
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8026 0V6	-.32060 -1	.99550				
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8027 0V7	-.24640	1.0203				
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8028 0V8	-.16537	.89469				
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8029 0V9	-.22531	1.0090				
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8030 0V10	-.21096	1.0192				
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8031 0V11	-.17478 -1	1.0954				
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8032 0V12	.13998 -2	1.0894				
111 V111	18.184	11.470	49	.1033	.71180	.4801
8033 0V13	-.22673 -1	1.1048				
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8034 0V14	-.21984	1.0791				
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8035 0V15	-.17325 -1	1.1168				
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8037 0V17	.25581	1.1204				
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8038 0V18	.20299 -1	1.0021				

111.V111	18.553	11.559	47	.2760	1.9266	.0604
8039.OV19	.23120	1.1343				
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8040.OV20	.18515	1.0885				
111.V111	18.553	11.559	47	.0430	.28845	.7743
8041.OV21	.10684	.99263				
111.V111	18.609	11.680	46	-.1245	-.83207	.4099
8042.OV22	.34799 -1	1.0298				
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8043.OV23	.23546	1.0955				
111.V111	19.122	11.507	41	-.2178	-1.3938	.1713
8044.OV24	.77429 -1	1.1204				
111.V111	18.222	11.151	36	-.2173	-1.2984	.2029
8045.OV25	-.16653	.91493				
111.V111	17.929	10.937	28	-.0615	-.31426	.7558
8046.OV26	-.46713 -1	.98322				
111.V111	19.087	11.277	23	-.3824	-1.8968	.0717
8047.OV27	.10867	.93292				
111.V111	19.333	12.210	15	-.1865	-.68459	.5056
8048.OV28	.21969 -2	.98301				
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8049.OV29	.24107 -1	1.2698				
112.V112	2.7059	3.1003	51	.1576	1.1170	.2694
8020.OV0	.35343 -1	1.0669				
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8021.OV1	.10269	1.0930				
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8024.OV4	.87116 -1	1.1443				
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8025.OV5	.22951 -2	1.0052				
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8026.OV6	-.18476 -1	.99026				
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8027.OV7	-.26111	1.0155				
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8028.OV8	-.18387	.89549				

112 V112	2.7059	3.1003	51	-.0212	-.14834	.8827
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8030 0V10	-.23150	1.0195				
112 V112	2.7059	3.1003	51	.0886	.62299	.5362
8031 0V11	-.41686 -1	1.0981				
112 V112	2.7059	3.1003	51	.1477	1.0457	.3008
8032 0V12	-.20222 -1	1.0894				
112 V112	2.7400	3.1221	50	-.0299	-.20735	.8366
8033 0V13	-.45012 -1	1.1049				
112 V112	2.7755	3.1442	49	-.2898	-2.0761	.0434
8034 0V14	-.23659	1.0742				
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8035 0V15	-.38059 -1	1.1146				
112 V112	2.7755	3.1442	49	-.2434	-1.7202	.0920
8036 0V16	.18623	1.1580				
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8037 0V17	.28124	1.1228				
112 V112	2.6458	3.0422	48	-.1472	-1.0097	.3179
8038 0V18	.54529 -1	1.0193				
112 V112	2.6458	3.0422	48	-.1523	-1.0453	.3013
8039 0V19	.26256	1.1430				
112 V112	2.6458	3.0422	48	-.0514	-.34935	.7284
8040 0V20	.20261	1.0836				
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8041 0V21	.90489 -1	.98853				
112 V112	2.6809	3.0653	47	.1109	.74865	.4580
8042 0V22	19659 -1	1.0239				
112 V112	2.6809	3.0653	47	.1632	1.1094	.2732
8043 0V23	.21757	1.0904				
112 V112	2.7381	3.1934	42	.3790	2.5903	.0133
8044 0V24	42164 -1	1.1300				
112 V112	2.7838	3.2415	37	.2853	1.7612	.0869
8045 0V25	-.15631	.90427				
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8046 0V26	-.79125 -2	.98785				
112 V112	3.0833	3.6226	24	.3579	1.7978	.0860
8047 0V27	17643	.97092				
112 V112	3.3125	3.8595	16	.2084	.79746	.4385
8048 0V28	18564 -1	.95193				

112.V112	4.0833	4.2095	12	0312	.98759 -1	.9233
8049.0V29	-.21736 -1	1.2211				

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